

HP IP Console Switch User Guide



June 2003 (Second Edition)
Part Number 263924-002

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About This Guide

This guide provides step-by-step instructions for installation and reference information for operation, troubleshooting, and upgrades for the HP IP Console Switch.

Audience Assumptions

This guide is for the person who installs, administers, and troubleshoots IP Console Switches. HP assumes you are qualified in the servicing of equipment and trained in recognizing hazards in products with hazardous energy levels.

Important Safety Information

Before installing this product, read the *Important Safety Information* document included with this product.

Symbols on Equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:



WARNING: This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.



This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.



This symbol indicates the presence of electric shock hazards. The area contains no user- or field-serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.



This symbol on an RJ-45 receptacle indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This symbol indicates the presence of a hot surface or hot component. If this surface is touched, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.



This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

Weight in kg
Weight in lb

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

Rack Stability



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
 - The full weight of the rack rests on the leveling jacks.
 - The stabilizing feet are attached to the rack if it is a single-rack installation.
 - The racks are coupled together in multiple-rack installations.
 - Only one component is extended at a time. A rack could become unstable if more than one component is extended for any reason.
-

Symbols in Text

These symbols can be found in the text of this guide. They have the following meanings.



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents essential information to explain a concept or complete a task.

NOTE: Text set off in this manner presents additional information to emphasize or supplement important points of the main text.

Related Documents

For additional information on the topics covered in this guide, refer to the *HP IP Console Switch Software Guide*.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Technical Support

In North America, call the HP Technical Support Phone Center at 1-800-652-6672. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored. Outside North America, call the nearest HP Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the HP website, www.hp.com.

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP Website

The HP website has information on this product as well as the latest drivers and flash ROM images. You can access the HP website at www.hp.com.

For product specific information, refer to the following website,
<http://h18004.www1.hp.com/products/servers/proliantstorage/rack-options/kvm/index-console.html>.

Authorized Reseller

For the name of your nearest authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the HP website for locations and telephone numbers.

Reader's Comments

HP welcomes your comments on this guide. Please send your comments and suggestions by email to ServerDocumentation@hp.com.

Overview

The HP IP Console Switch combines analog and digital technology to provide flexible, centralized keyboard, video, and mouse (KVM) control of data center servers. This solution provides enterprise customers with a significant reduction in cable volume, secure remote access, and high performance server KVM access.

Each unit has 16 server ports (with RJ-45 connections) and provides optimal digital video performance with a maximum resolution of 1280 x 1024 at 75 Hz, up to 15.24 meters (50 feet), and a maximum resolution of 800 x 640 at 60 Hz, up to 30.48 meters (100 feet).

The IP Console Switch works over standard LAN connections, providing access across a 100Base-T Ethernet connection for one or up to three simultaneous IP users, depending on the model, and for one user directly through a local port. The IP Console Switch uses Ethernet networking infrastructure and TCP/IP protocol to transmit KVM information between operators and connected computers.

Although 10Base-T Ethernet can be used, HP recommends a dedicated, switched 100Base-T network for improved performance.

Features

The features of the IP Console Switch include:

- Both local and IP KVM functionality
- Support for up to 128 servers
- Firmware flashable over serial port and NIC
- Compatibility with HP video monitors and “hotkeys” on all HP keyboards, including the HP TFT5600RKM
- Field-terminable CAT5 cables
- Near real-time mouse/cursor speed
- Multiple language support through programmable ROM SoftPak—English, Spanish, French, Dutch, German, Italian, and Japanese
- Support for 10/100 NIC ports
- Application clients that manage 25 IP Console Switches with 512 target devices
- 1U form with the ability to mount in a 0U side-mount configuration, as well as behind HP rack-mount keyboards

Benefits

The benefits of the IP Console Switch include:

- Significant reduction of KVM cable volume by using an Interface Adapter and single unshielded twisted pair (UTP) CAT5 cabling
- Facilitation of KVM access in higher server density environments because of an increase in the number of ports available
- KVM access through network connection
 - No special software or drivers are required on the attached computers, including the host.
 - Users access the unit and all attached systems through Ethernet from a user running the IP Console Viewer.
 - User can be located anywhere a valid network connection exists.
- Integration with existing HP and Compaq KVM switches, adding IP access

NOTE: The HP IP Console Switch is not compatible with HP classic analog KVM switches.

IP Console Switch Components

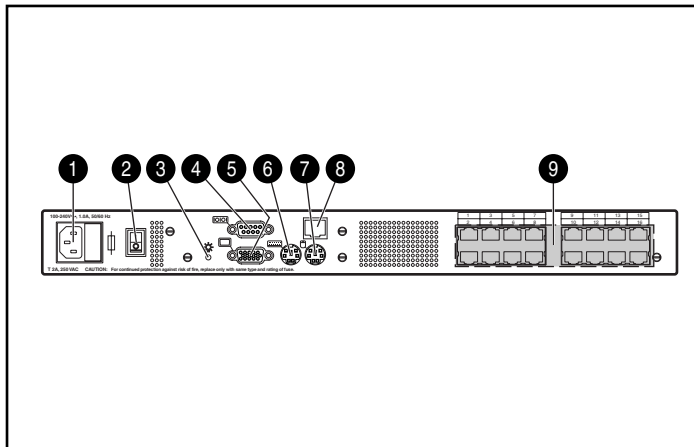


Figure 1-1: IP Console Switch components

Item	Description
1	Power connector
2	Power switch
3	Activity indicator
4	Serial download connector
5	Monitor connector for local user
6	Keyboard connector for local user
7	Mouse connector for local user
8	LAN connector
9	Server connection ports

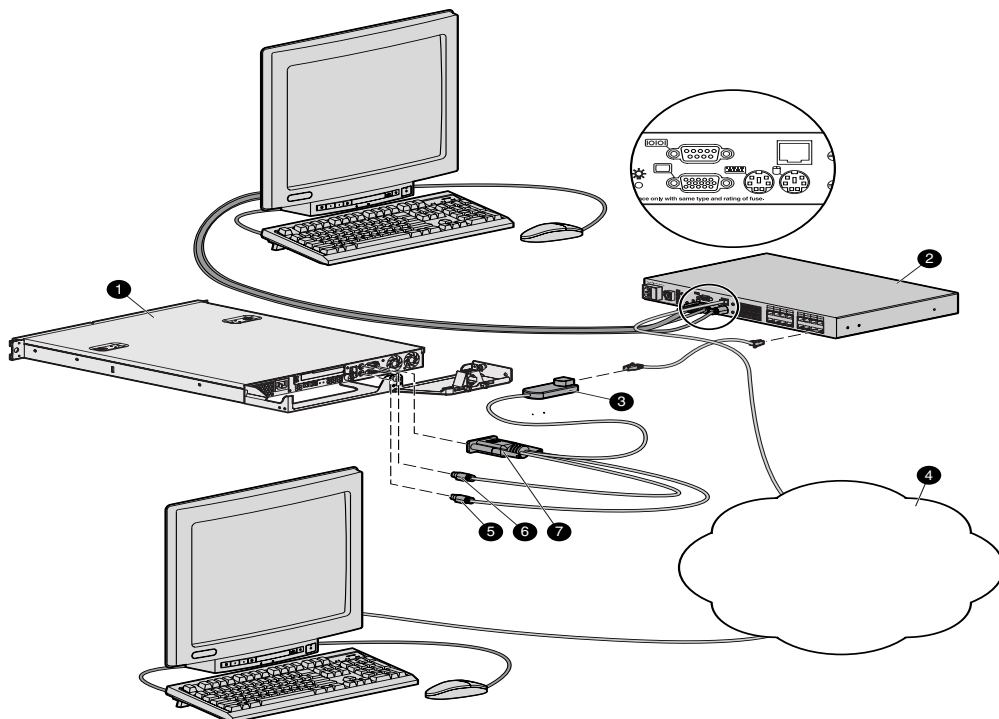


Figure 1-2: Example of an IP Console Switch configuration

Item	Description
1	CPU
2	IP Console Switch
3	Interface Adapter
4	Network
5	Keyboard connector
6	Mouse connector
7	Video connector

Installing the IP Console Switch

You must install the IP Console Viewer prior to using the IP Console Switch. The IP Console Viewer enables you to view and control a server attached to the console switch system, configure and maintain the system, and prevent unauthorized access to the console switch through IP connection. For more information, refer to the *HP IP Console Switch Software Guide* included on the Rack Products Documentation CD.

NOTE: The analog port does not require the IP Console Viewer software for operation. The analog port uses the on-screen display (OSD). For more information, refer to Chapter 6.

The IP Console Switch system uses Ethernet networking infrastructures and TCP/IP protocol to transmit keyboard, video, and mouse information between operators and connected computers. Although 10Base-T Ethernet can be used, a dedicated, switched 100Base-T network provides improved performance.

Installation Checklist

Before installing the IP Console Switch, refer to the following lists to be sure that all of the listed components were received.

Kit Contents

- IP Console Switch
- Power cords
- Rack mounting kit
- Download serial cable
- Documentation kit
- Firmware/software CD
- CAT5 crossover cable

Required Tool

You need a Phillips screwdriver.

Optional Items

- Expansion Module
- Interface Adapter
- UTP CAT5 cable

Setting up Your Network

The IP Console Switch system uses IP addresses to uniquely identify the console switches and computers running the IP Console Viewer. The IP Console Switch supports both BootP (a subset of DHCP) and static IP addressing. HP recommends that IP addresses be reserved for each unit and that they remain static while the console switches are connected to the network.

Rack Mounting the IP Console Switch

The IP Console Switch ships with rack mounting brackets for easy integration in to your rack. Before installing the console switch and other components in the rack cabinet (if not already installed), stabilize the rack in a permanent location. Install your equipment starting at the bottom of the rack cabinet, then work to the top. Avoid uneven loading or overloading of rack cabinets.

NOTE: Prior to installing the IP Console Switch into the rack, connect the console switch to a power source, using the power cords provided and power on the unit. A green activity indicator is displayed after a few seconds. If the green activity indicator does not display, be sure that the power is on, that the power cord is connected, and the power source is valid. For more information, refer to the troubleshooting chapter in this guide.

Three different rack-mounting configurations are described in the sections below:

- Side mount 0U
 - Type A—Square and round internal mounting rail holes
 - Type B—Square internal mounting rail holes
- Rear rack mount
- Standard 1U mount

Using Side Mount 0U Installation

Type A

To side mount the IP Console Switch:

1. Attach the side-mounting brackets to the console switch, using two screws on each side.

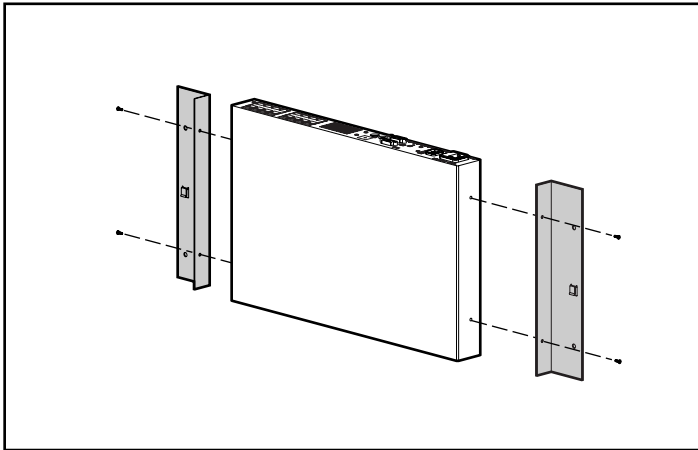


Figure 2-1: Attaching the side-mounting brackets

2. Slide the tabs on the side-mounting brackets into the same U location on each side of the rack.

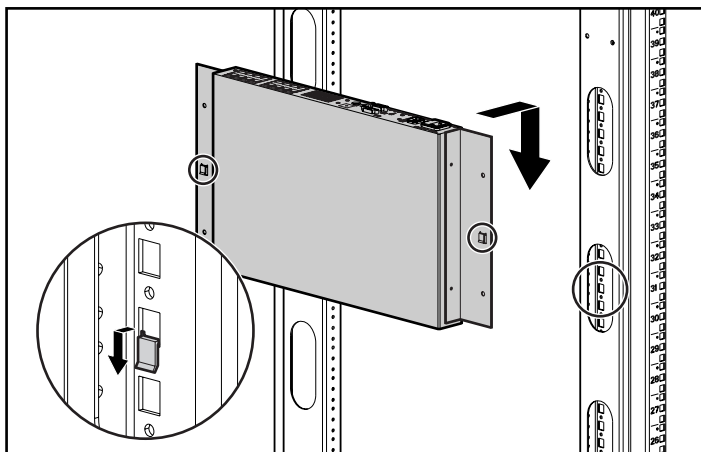


Figure 2-2: Sliding the tabs into the rack

3. Secure the console switch to the rack frame, using two screws on each side.

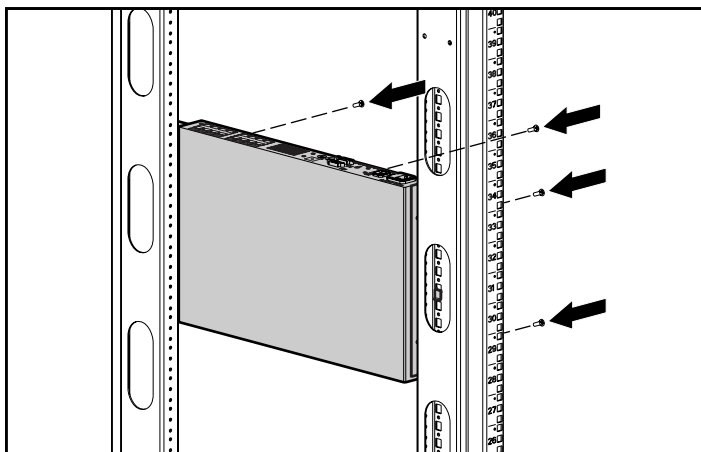


Figure 2-3: Securing the console switch

Type B

1. Attach the side-mounting brackets to the console switch, using two screws on each side.
2. Slide the tabs on the side-mounting brackets into the same U location on each side of the rack.

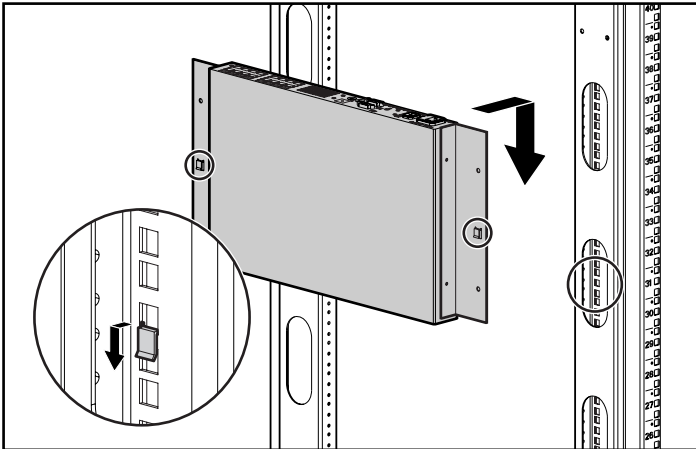


Figure 2-4: Sliding the tabs into the rack

3. Insert four cage nuts into the rack frame in the location of the side-mounting bracket holes.

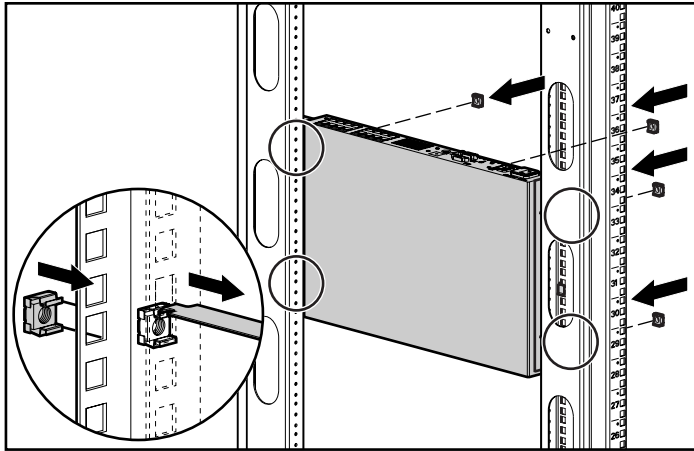


Figure 2-5: Inserting cage nuts

4. Secure the console switch to the rack frame, using two screws on each side.

Using Rear Rack Installation

IMPORTANT: If you are installing a console switch with a 1U component, such as the 1U Keyboard Drawer Rack Option Kit, additional rack space is not required, making it a 0U installation.

To install the IP Console Switch in the rear of the rack:

1. Attach the slide rail brackets to the console switch, using two screws on each slide.

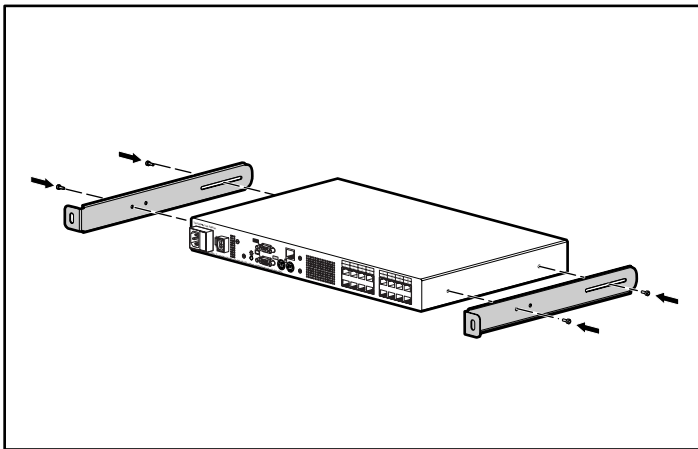


Figure 2-6: Attaching the slide rail brackets

2. If a cage nut is not already installed behind the rear rail, install one at this time.
3. Slide the console switch, with the slide rail brackets, into the rail-mounting brackets already installed in the rack.

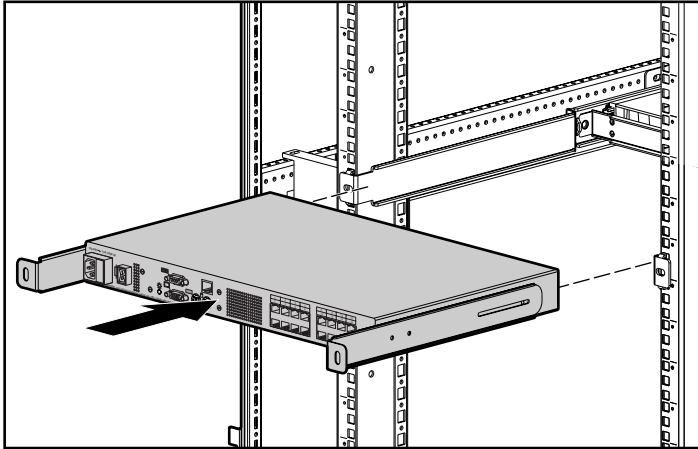


Figure 2-7: Sliding the console switch into the rack

4. Secure the slide rail brackets to the rear of the rack, using two screws on each side.

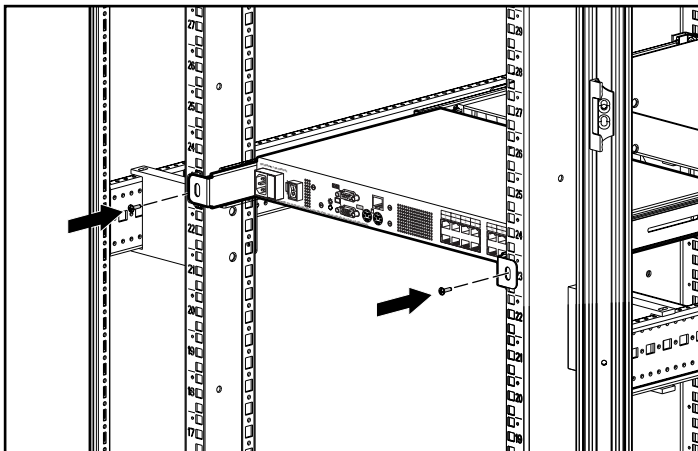


Figure 2-8: Securing the slide rail brackets to the rack

Using Standard 1U Installation

To install the console switch:

1. Attach the slide rail brackets to the console switch, using the two screws on each side.
2. Use the template that was shipped with the component to mark the location of the mounting hardware.
 - a. Push back the tabs (marked ☆) on the top of the template, and place them in the correct holes in the mounting rails.

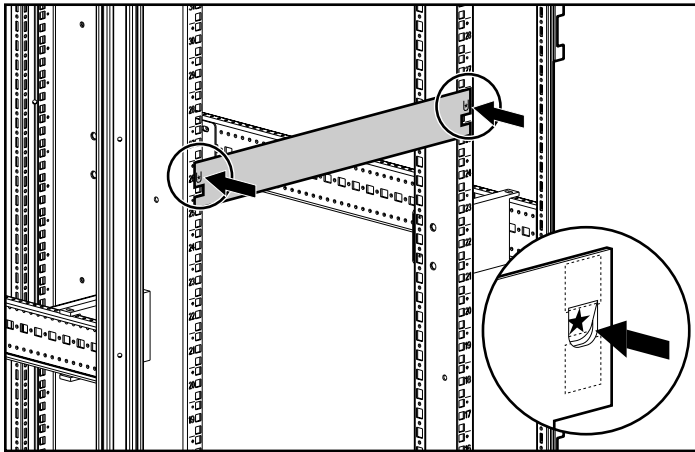


Figure 2-9: Measuring with the rack template

- b. Match up the hole pattern, indicated on the sides of the template, with the hole pattern on the mounting rails.
- c. Measuring from the top of the component immediately below the new component, place the template against the front and rear of the rack frame to mark the attachment points for the mounting rails and rear cage nuts.

3. Install two cage nuts into the holes marked by the template at the rear of the rack.

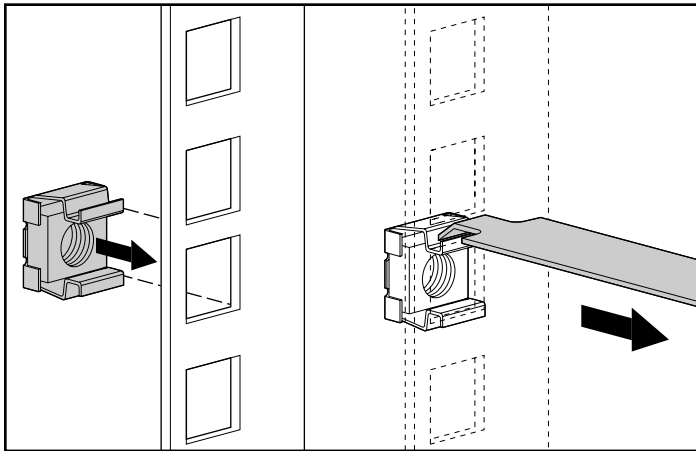


Figure 2-10: Installing cage nuts

4. Loosely attach the wing nuts (1), and extend the adjustable rail-mounting brackets to the desired length (2).

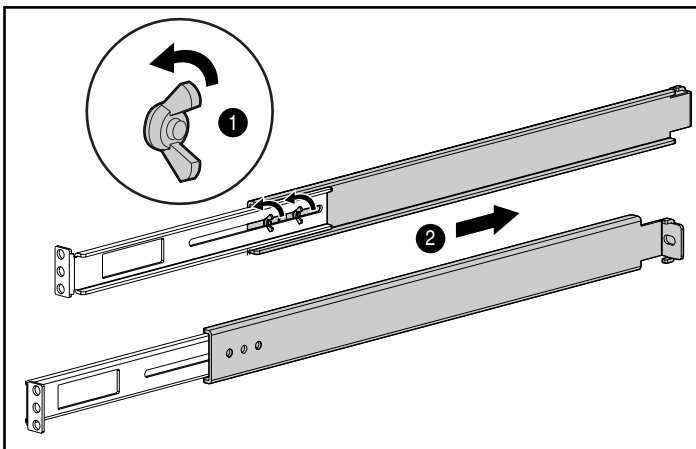


Figure 2-11: Adjusting rails

5. Tighten the wing nuts slightly to stabilize the adjustable rails during installation.
6. Insert an adjustable rail into the rack, and hook the tabs into the appropriate holes at the rear of the rack, aligning the screws holes at the front of the rack.
7. Secure the rear of the adjustable rail, using one screw for each cage nut previously installed.

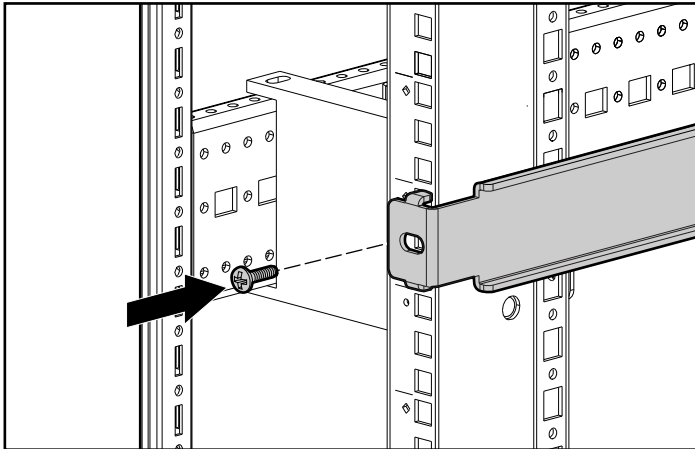


Figure 2-12: Securing the adjustable rail

- Secure the front of the adjustable rail to the rack, using two screws for each rail.

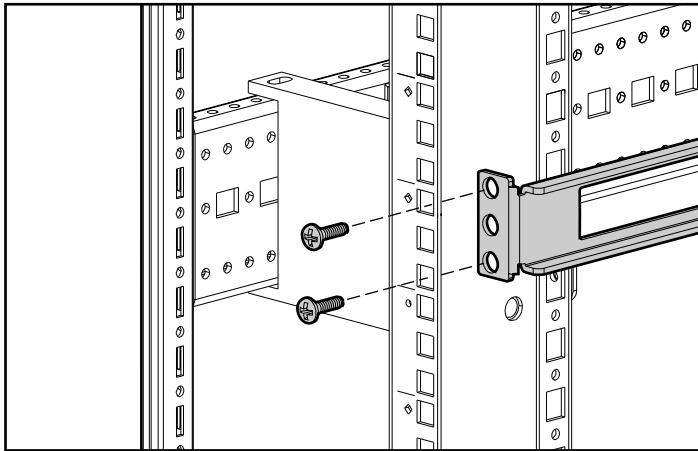


Figure 2-13: Securing the adjustable rail

- Slide the console switch into the adjustable rails, and secure it to the rear of the rack, using one screw on each side.

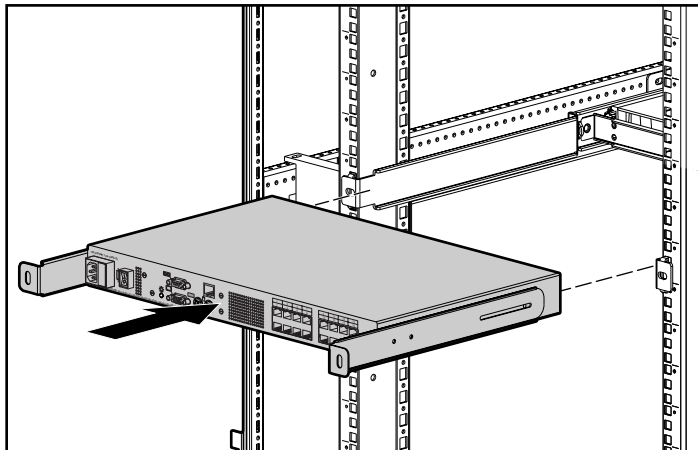


Figure 2-14: Securing the console switch into the rack

10. Position the front cover panel, and secure it to the front of the rack, using one screw on each side.

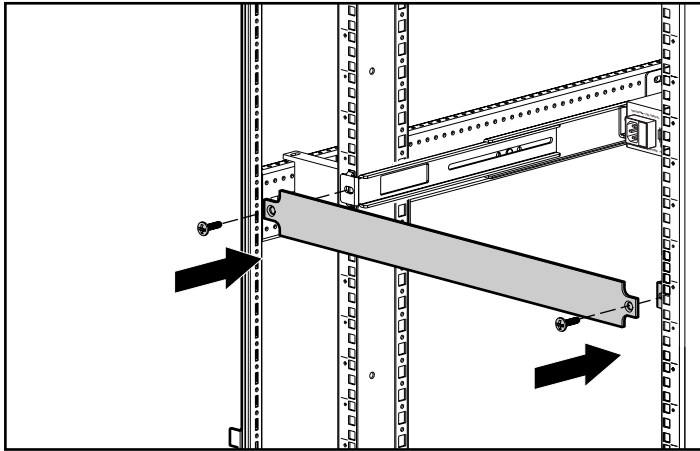


Figure 2-15: Positioning the front cover panel

Configuring the IP Console Switch Hardware

To configure the IP Console Switch hardware:

1. Connect one end of a serial cable to an available COM port on the server that is to be viewed locally from the IP Console Switch.
2. Connect the other end of the serial cable to the serial port on the IP Console Switch.
3. Plug the supplied power cord in to the rear of the IP Console Switch and then in to a valid power source.
4. Power on the IP Console Switch. The activity indicator on the rear panel powers on. The activity indicator blinks for 30 seconds while performing a self-test. Approximately 10 seconds after it stops blinking, press the **Enter** key to access the main menu.

5. Configure the terminal emulation software for the server, such as HyperTerminal for Microsoft® Windows® operating systems or Minicom for Linux operating systems.

To configure HyperTerminal:

- a. From the desktop screen, click **Start, Programs, Accessories, Communications, HyperTerminal**. The **Connection Description** window is displayed.
- b. Enter a name for the description, and click **OK**. The **Connect To** window is displayed.
- c. Select the **Communication Port** that is connected to the KVM switch through a serial cable, then click **OK**. The **COM1 Properties** window is displayed.
- d. Select **9600** for the Bits Per Second, **8** for Data Bits, **None** for Parity, **1** for Stop Bits, and **None** for Flow Control, then click **OK**. The HyperTerminal auto-connects to the console switch.
- e. Press the **Enter** key to access the console switch option menu.

To configure Minicom:

IMPORTANT: Minicom is a utility that is loaded during the installation of Red Hat 7.2 and 7.3. However, if you do not select the option to install the Linux Utilities during the operating system installation, you are not able to use Minicom without downloading the Minicom 1.831-16.i386.rpm file from the Red Hat website. (Refer to the procedure for installing RPMs on the Red Hat website).

- a. Log on to a Linux console, or open a terminal and enter `minicom-s` at the command prompt. The **Configuration** menu is displayed.
- b. Select **Serial Port Setup**. The **Change which setting?** menu is displayed.
- c. Select **Option A (Serial Device)**. Manually change the device type from “dev/modem” to “/dev/ttyS0” and press the **Enter** key.
- d. Select **Option E (Bps/Par/Bits)**. The **Comm Parameters** menu is displayed.
- e. Select **E (Speed 9600 Bps)**, and press the **Enter** key. The designation 9600 8N1 is displayed next to Option E.

- f. Select **Option F (Hardware Flow Control)**.
Be sure that the **Change which setting?** menu is configured as follows:
 - A—Serial Device: /dev/ttyS0
 - B—Lockfile Location: /var/lock
 - C—Callin Program:
 - D—Callout Program:
 - E—Bps/Par/Bits: 9600 8N1
 - F—Hardware Flow Control: No
 - G—Software Flow Control: No
- g. Press the **Enter** key to return to the **Configuration** menu. Scroll down to the **Save setup as dfl** option, and press the **Enter** key.
- h. Scroll down the **Configuration** menu to the **Exit from Minicom** option, and press the **Enter** key.

- i. From the Linux Red Hat 7.2 and 7.3 command prompt, enter `minicom`. As soon as a connection is established, the **Main** menu for the IP Console Switch is displayed. Follow the on-screen options to configure the IP Console Switch. The **IPViewer HyperTerminal** menu with six options is displayed.

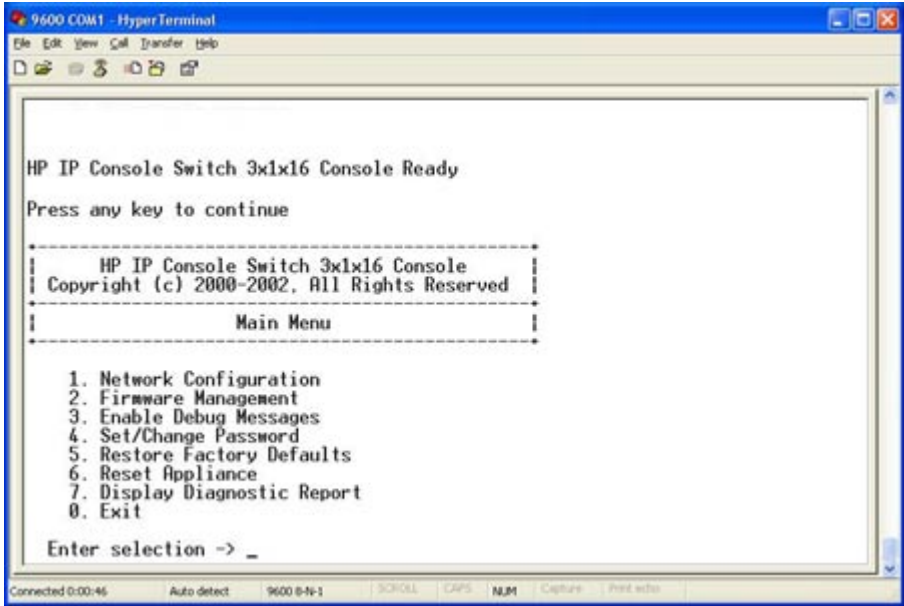


Figure 2-16: IPViewer HyperTerminal menu

6. Select **Option 1—Network Configuration**. The **Network Configuration** menu is displayed.

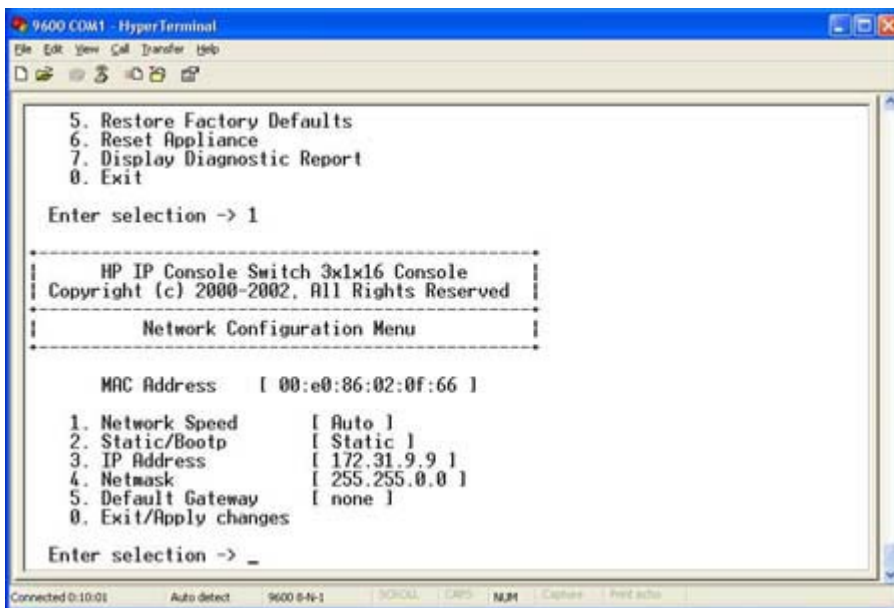


Figure 2-17: Network Configuration menu

7. Select **Option 1** to set the network speed. When possible, set the connection manually without relying on the auto negotiate feature. After you enter your selection, you return to the **Network Configuration** menu.
8. Select **Option 2** to specify a static or BootP IP address. Use a static IP address for ease of configuration. If you are using a BootP address, configure your BootP server to provide an IP address to the console switch, omit step 9, and continue to the next procedure.
9. Select **Option 3 through 5** from the **Terminal Applications** menu to finish configuring the console switch for an IP address, Netmask, and Default Gateway. When this configuration is complete, enter **0** to return to the **IPViewer HyperTerminal** menu.

Adjusting the Mouse Acceleration

Before a server can connect to the IP Console Switch, an adjustment to the mouse acceleration must be made. Use the default Microsoft Windows PS/2 mouse driver for all attached Microsoft Windows systems attached to the console switch.

NOTE: To ensure optimum mouse performance, refer to the “Setting the Mouse Scaling” and “Aligning and Resetting the Mouse” sections in the *HP IP Console Switch Software Guide*, included on the Rack Products Documentation CD.

For Windows operating systems (default drivers):

1. From the desktop, select **Start, Settings, Control Panel**, and double-click the **Mouse** icon.
2. Select the **Motion** tab.
3. For Windows NT, set **Pointer Speed** to **Slow** and the **Acceleration** setting to **None**.

-or-

For Windows 2000, set the **Speed** setting to **50%** (default) and the **Acceleration** setting to **None**.

-or-

For Windows XP, set the set the **Speed** setting to **50%** (default) and the **Acceleration** setting the 6th position from the far left.

For Linux operating systems:

1. From the **GNOME** desktop, click **main** menu.
2. From the main menu task list, select **Programs, Settings, Peripherals**.
3. From the Peripherals task list, select **Mouse**. The **Mouse Configuration** window is displayed. In this window, you can set the mouse to be either right-handed or left-handed, and adjust the mouse motion by changing the threshold and adjusting the acceleration to the 4th position from the far left.

Adding Servers

Although you configure the entire IP Console Switch system through either the OSD or the IP Console Viewer, HP recommends first adding server names to the OSD at the local analog station, before adding or discovering the console switch in the IP Console Viewer at the digital station.

To add server names:

1. Launch the OSD at the local analog station, and input all server names. You can also customize the OSD, as well as access the IP Console Switch from the analog station. For detailed instructions on OSD setup and configuration, refer to Chapter 6 in this guide.
2. After you install the IP Console Viewer on each digital station, launch the IP Console Viewer and click **Add Console Switch** to add the new IP Console Switch. The server names you entered in the OSD now are displayed in the IP Console Viewer for all servers and Interface Adapters that are powered online. The Interface Adapters that are offline can be added later using the **Resync** feature.

For more information, refer to the *HP IP Console Switch Software Guide*, included with your console switch.

Expansion Module

An optional Expansion Module can be added to the IP Console Switch system, enabling access for up to 8 servers on each port, increasing the total number of accessible servers to 128.

Features

The features of the Expansion Module include:

- Connection to an IP Console Switch through a single UTP CAT5 cable
- Connection to each Interface Adapter through a single UTP CAT5 cable
- Connections for eight Interface Adapters
- An active KVM connection between one IP Console Switch port and one Interface Adapter at a time
- No external power required
- Ability to mount along the sides or along the rear of standard 19-inch internal mounting rails

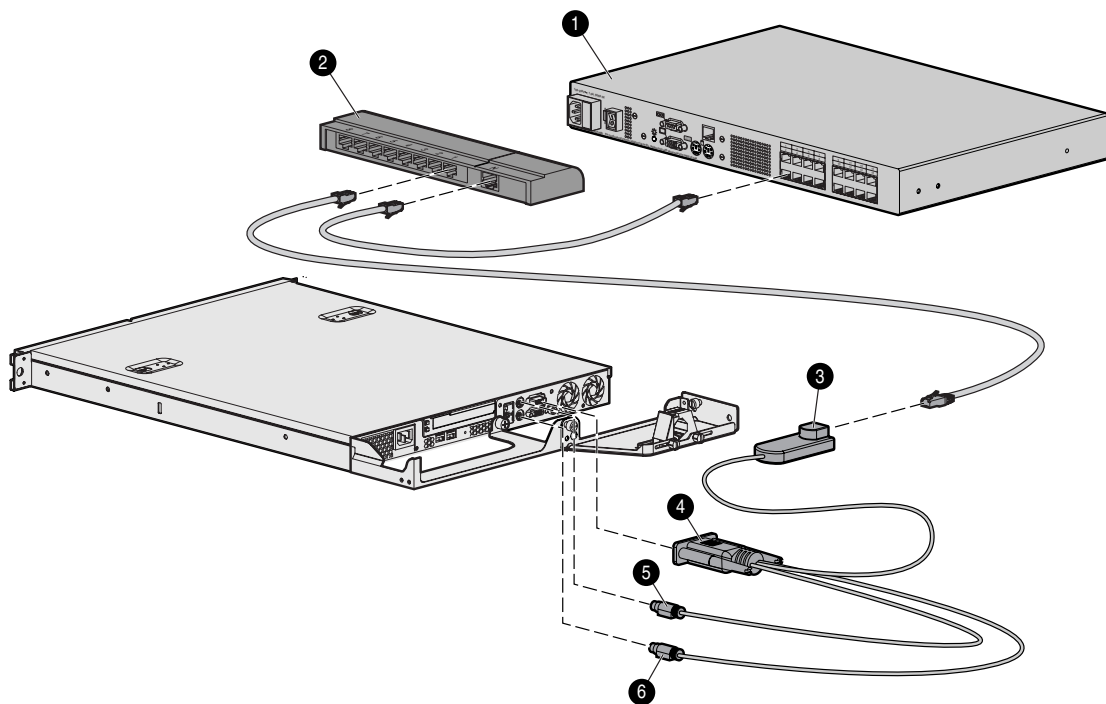


Figure 3-1: Example of an IP Console Switch configuration with an Expansion Module

Item	Description
1	IP Console Switch
2	Expansion Module
3	Interface Adapter
4	Video connector
5	Keyboard connector
6	Mouse connector

Installing the Expansion Module Hardware

Performing a Side-Mount Installation

To side mount an Expansion Module to the rack:

1. Slide the tabs on the side-mounting brackets into the rack frame.

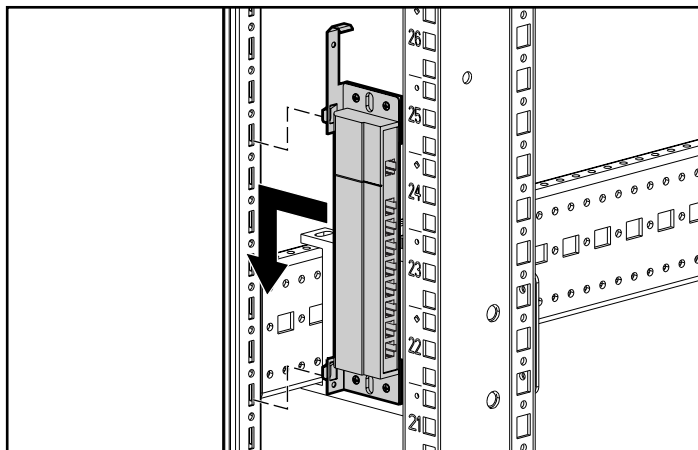


Figure 3-2: Sliding the tabs into the rack

2. Secure the Expansion Module to the rack frame, using one self-tapping screw for the bottom side-mounting bracket.

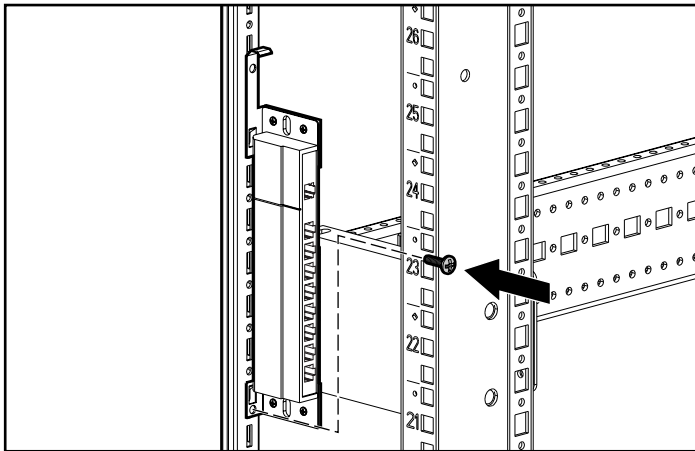


Figure 3-3: Inserting screw

Performing a Rail-Mount Installation

To rail mount an Expansion Module to the rack:

1. Remove screws securing the side-mounting brackets to the Expansion Module.

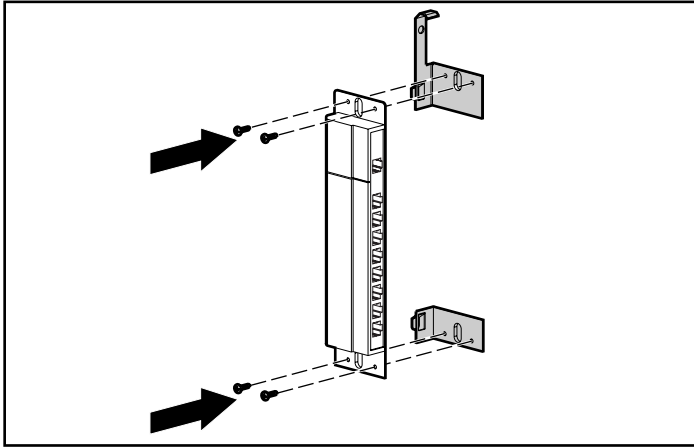


Figure 3-4: Removing screws

2. Position the Expansion Module, and insert two cage nuts into the rack frame where the mounting bracket holes are located (1). Secure the Expansion Module to the rack frame, using two M-6 screws (2).

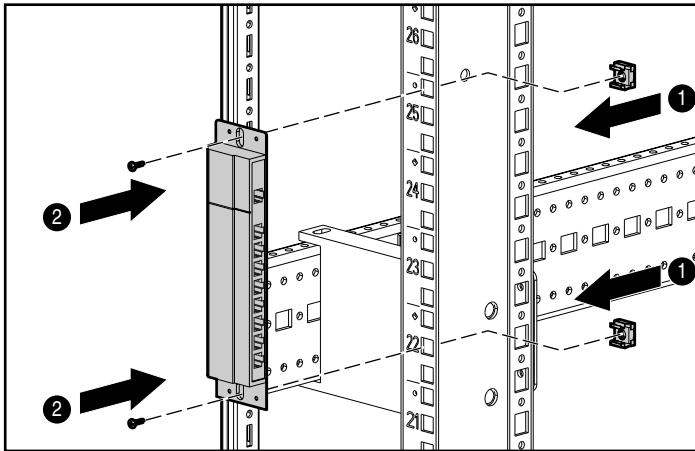


Figure 3-5: Installing the Expansion Module

Performing a Velcro-Mount Installation

To Velcro mount an Expansion Module to the rack:

1. Determine the location for the Expansion Module.
2. Remove the protective strip (1) from the Velcro, and attach it to the Expansion Module.
3. Remove the protective strip (1) from the other side of the Velcro, and attach it to the rack frame (2).

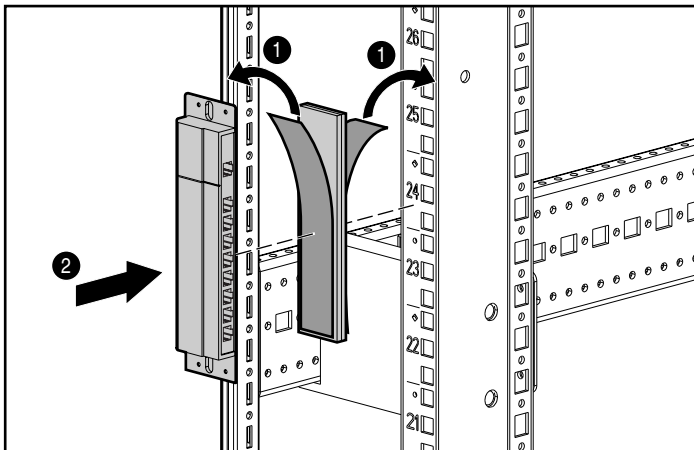


Figure 3-6: Velcro-mounting the Expansion Module

Installing the Expansion Module into the IP Console Switch System

To install an optional Expansion Module into the IP Console Switch system:

1. Mount the Expansion Module into the rack, using one of the previously described methods.
2. Locate up to nine UTP CAT5 cables.
3. Connect one end of a UTP CAT5 cable to the desired port on the rear panel of the IP Console Switch.
4. Attach the other end of the UTP CAT5 cable to the IN port on the Expansion Module.
5. Connect one end of another UTP CAT5 cable to the OUT port on the Expansion Module.
6. Attach the other end of the second UTP CAT5 cable to the Interface Adapter.
7. Repeat steps 5 through 6 to connect any other servers.

Interface Adapters

An optional Interface Adapter can be added to the IP Console Switch system, connecting UTP CAT5 cables to standard VGA video and PS/2 connections.

Features

The features of an Interface Adapter include:

- Connection to an IP Console Switch through a single UTP CAT5 cable
- Reduction of cable bulk
- No external power required
- Compatible with Compaq legacy console switches
- Keep Alive functionality, enabling continuous mouse and keyboard data activity to attached servers, even when the IP Console Switch is powered off
- Ability to identify Interface Adapter ID or EID from local or remote access

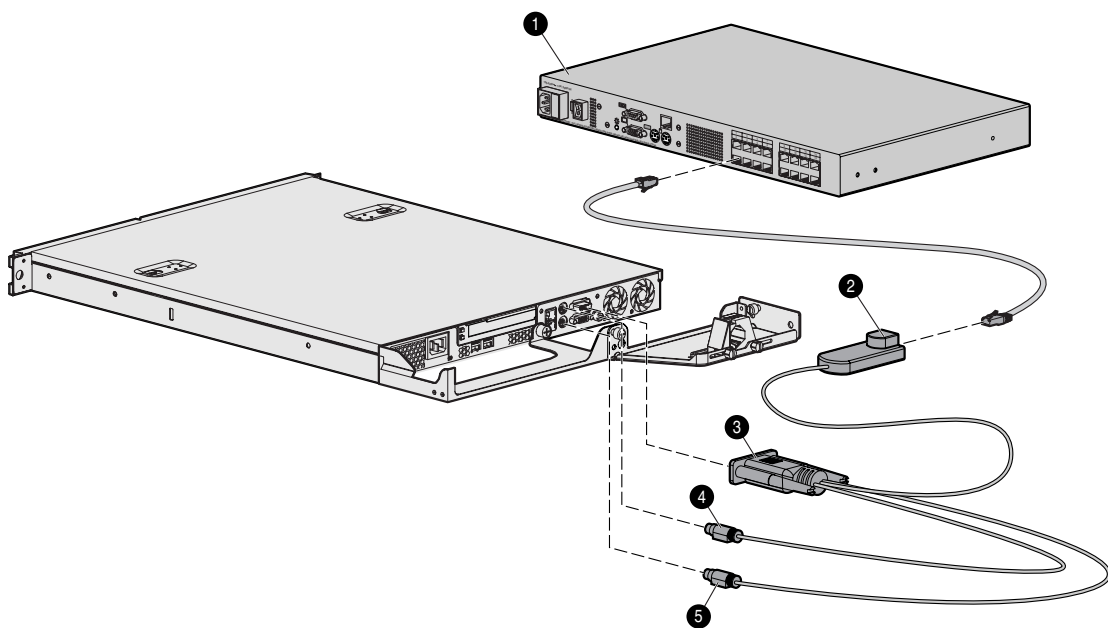


Figure 4-1: IP Console Switch configuration with an Interface Adapter

Item	Description
1	IP Console Switch
2	Interface Adapter
3	Video connector
4	Keyboard connector
5	Mouse connector

Connecting an Interface Adapter to the IP Console Switch System

To connect an Interface Adapter to each server:

1. Locate the Interface Adapter.
2. Attach the appropriate color-coded connectors on the Interface Adapter to the KVM ports on the server that connects to the IP Console Switch.
3. Connect one end of a UTP CAT5 cable to the desired port on the rear panel of the IP Console Switch.
4. Connect the other end of the UTP CAT5 cable to the RJ-45 connector on the Interface Adapter.
5. Repeat the steps 1 through 4 for all servers.

Cascade Console Switches

The IP Console Switch enables Compaq legacy console switches to be cascaded in the IP Console Switch system. Compatible models include:

- 1 x 4 [PN: 400336 (-001)(-291)(-B31)]
- 1 x 8 [PN: 400337 (-001)(-291)(B-31)]
- 2 x 8 [PN: 400338 (-001)(-291)(B-31)]
- 2 x 8 48VDC [PN: 400542-B21]

IMPORTANT: All Compaq legacy console switches must be upgraded with SoftPaq firmware, version 2.1.0 or later. If you do not upgrade the legacy console switches, the IP Console Switch system will not recognize them.

The IP Console Switch system supports only one level of cascading. To be sure that the equipment performs at optimum levels, follow proper power-on sequences while cascading console switches.

IMPORTANT: An Expansion Module is considered a level of cascading and, therefore, cannot be used in combination with a cascaded Compaq legacy console switch.

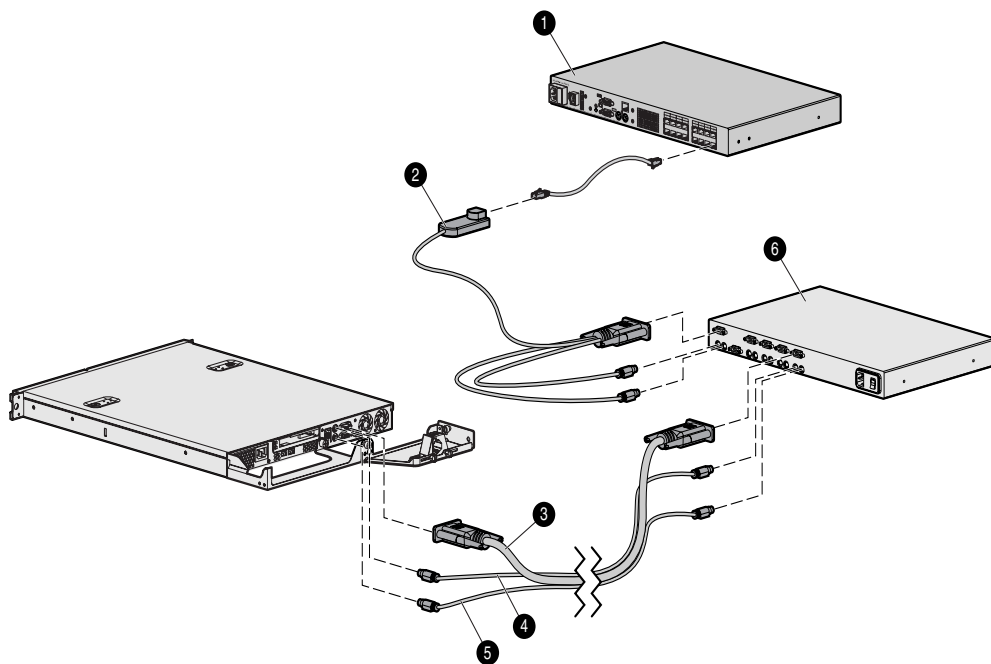


Figure 5-1: Example of an IP Console Switch system with tiering

Item	Description
1	IP Console Switch
2	Interface Adapter
3	Video connector
4	Keyboard connector
5	Mouse connector
6	Compaq legacy console switch

Connecting Cascade Switches to the IP Console Switch System

NOTE: You cannot access any servers on a cascaded Compaq legacy console switch remotely from the IP Console Viewer unless the IP Console Switch is in Free Mode. Free Mode can be achieved by pressing the **Alt + 0** keys from the **Main** menu. If the IP Console Switch is not in Free Mode, the following message is displayed: **<server name> is not available for viewing, Reason: Channel In Use By Local User.**

To connect a cascade switch (optional) to the IP Console Switch system:

1. Mount the console switch the rack. Locate a UTP CAT5 cable to connect your console switch to the Interface Adapter for your console switch.
2. Attach one end of a UTP CAT5 cable to the RJ-45 connector on the Interface Adapter.
3. Connect the other end of the UTP CAT5 cable to the desired port on the rear panel of the console switch.
4. Attach the keyboard, monitor, and mouse connectors of the Interface Adapter to a user port on your cascaded console switch.
5. Connect the servers to the cascade switch, according to the cascade switch instructions included with that console switch.
6. Power on the console switch to enable the cascade code.
7. Repeat steps 1 through 6 for any other console switches you want to add to the IP Console Switch system.

Cascading 2 x 8 Compaq Legacy Console Switches into the IP Console Switch System

When connecting to a Compaq legacy 2 x 8 console switch, it is important to only connect one Interface Adapter to the console switch at any given time. If multiple Interface Adapters are attached, undesirable operation can occur.

Local Port Operation

The IP Console Switch has a local port on the rear panel that enables the user to connect a KVM to the console switch for direct access. The IP Console Switch also uses an OSD that enables the user to configure the system.

Viewing and Selecting Ports and Servers

Use the OSD **Main** dialog box to view, configure, and control servers in the IP Console Switch system. You can also view your servers by name, port, or by the unique EID embedded in each Interface Adapter. When the OSD is first launched, an OSD-generated port list is displayed by default.

The Port column indicates the port to which a server is connected. If you connect a legacy KVM console switch to the console switch, the port numbering displays the port then the console switch port to which the server is connected.

Accessing the Main Dialog Box

To access the **Main** dialog box:

Press the **Print Scrn** key. The **Main** dialog box is displayed.

NOTE: You can also press the **Ctrl** key twice within one second to launch the OSD. You can use this key sequence in any place you see **Print Scrn** throughout this user guide.

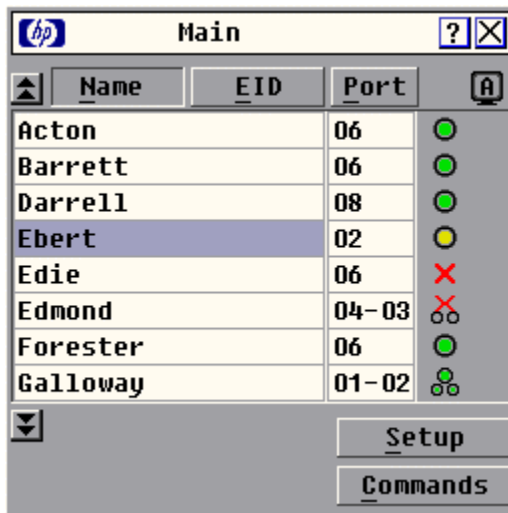








Figure 6-1: Main dialog box

Viewing the Status of your IP Console Switch System

The status of the servers in your system is indicated in the right column of the **Main** dialog box.

Table 6-1: OSD Status Symbols

Item	Description
	(green circle) Interface Adapter is connected or powered on.
	Interface Adapter is not connected or is powered off.
	Interface Adapter is tiered to another console switch and is not connected or is powered off.
	Interface Adapter is tiered to another console switch and is connected or powered on.
	(yellow circle) Interface Adapter is being upgraded.
	A symbol that identifies which console switch is being used.

Selecting Servers

From the **Main** dialog box, users can select specific servers. When a new server is selected, the IP Console Switch reconfigures the KVM to the settings for the selected server.

To select servers:

Double-click server **Name**, **EID**, or **Port** number.

NOTE: The EID is an electronic identification number, found on the Interface Adapter cable label, automatically assigned to the Interface Adapter.

-or-

If the display order of the server list is by port (the **Port** button is selected), enter the Port number and press the **Enter** key.

-or-

If the display order of the server list is by **Name** or **EID** number (the **Name** or **EID** button is selected), enter the first few letters of the Name of the server or the EID number to establish it as unique, and then press the **Enter** key.

Selecting Previous Servers

To select previous servers:

Press the **Print Scrn** key, then press the **Backspace** key. This key combination toggles between the previous and current connection.

Disconnecting Users from a Server

To disconnect from a server:

Press the **Print Scrn** key, then press the **Alt + 0** keys. This leaves no server selected and in a free state. The status flag on the OSD displays **Free**.

Soft Switching

Soft switching is the ability to switch servers, using a hotkey sequence. You can soft switch to a server by pressing the **Print Scrn** key and entering the first few characters of its name or number. If you have set a Screen Delay Time and you press the key sequences before that time has elapsed, the OSD does not display.

Configuring Servers for Soft Switching

To configure servers for soft switching:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup**. The **Setup** dialog box is displayed.
3. Click **Menu**. The **Menu** dialog box is displayed.
4. For **Screen Delay Time**, enter the number of seconds of delay desired before the **Main** dialog box displays after the **Print Scrn** key is pressed.
5. Click **OK**.

Soft Switching Servers

To soft switch servers:

1. To select a server, press the **Print Scrn** key. If the display order of your server list is by port (the **Port** button is selected), enter the Port number and press the **Enter** key.

-or-

If the display order of the server list is by Name or EID number (the **Name** or **EID** button is selected), enter the first few letters of the Name of the server or the EID number to establish it as unique, and then press the **Enter** key.

2. To switch back to the previous server, press the **Print Scrn** key, then press the **Backspace** key.

Using Basic OSD Navigation

The following table describes the keyboard and mouse OSD navigation keys.

Table 6-2: OSD Navigation Keys

Keystroke	Function
Print Scrn	Opens the OSD. Press the Print Scrn key twice to send the Print Scrn keystroke to the currently selected device.
F1	Opens the Help screen for the current dialog box.
Esc	Closes the current dialog box without saving changes and returns to the previous dialog box. In the Main dialog box, it closes the OSD and returns to the selected server. In a message box, it closes the pop-up box and returns to the current dialog box.
Alt	When used in combination with the other keys, opens dialog boxes, selects options, and executes actions.
Alt + X	Closes the current dialog box and returns to the previous dialog box.
Alt + O	Selects the OK button and returns to the previous dialog box.
Enter	Completes the console switch operation in the Main dialog box and exits the OSD.
Single-Click, Enter	In a text box, selects the text for editing and enables the left and right arrow keys to move the cursor. Press the Enter key again to quit Edit mode.

continued

Table 6-2: OSD Navigation Keys *continued*

Keystroke	Function
Print Scrn, Backspace	Toggles back to the previous selection if no other keystrokes have been entered.
Print Scrn, Alt + 0	Immediately disengages user from a server—no server is selected. Status Flag displays Free . (This only applies to the 0 on the keyboard, not the keypad.)
Print Scrn, Pause	Immediately activates the screen saver mode and prevents access to that particular console, if it is password protected.
Up/Down Arrows	Moves the cursor from line to line.
Right/Left Arrows	Moves the cursor between columns. When editing a text box, these keys move the cursor within the column.
Page Up/Page Down	Pages up and down through Name and Port lists.
Home/End	Moves the cursor to the top or bottom of a list.
Backspace	Erases characters in a text box.
Delete	Deletes current selection in the Scan dialog box or characters in a text box.
Shift + Delete	Deletes from current selection to all lines below it when editing a scan list.
Numbers	Entered from the keyboard or keypad.
Caps Lock	Disables user. (Use the Shift key to change case.)

Configuring the OSD Setup Menu

You can configure the IP Console Switch from the **Setup** menu within the OSD. Select the **Names** button when initially setting up your console switch to identify servers by unique names. Select the other setup features to manage routine tasks for your servers from the OSD menu.

Table 6-3: Features to Manage Routine Tasks for Servers

Button	Function
Menu	Changes the server listing between numerically by Port or EID number and alphabetically by name.
	Changes the Delay Time before the Main dialog box displays after pressing the Print Scrn key.
Flag	Changes the display, timing, color, and location of the status flag.
Broadcast	Simultaneously controls multiple servers through keyboard and mouse actions.
Scan	Sets up custom scan patterns for up to 16 servers.
Security	Sets password to restrict server access and enables screen saver. A valid password must be alphanumeric and contain a minimum of 5 characters and a maximum of 15 characters. Permitted characters are case-sensitive and can consist of A–Z, 0–9, spacebar, and hyphen.
	Enables the screen saver.
Devices	Identifies device types attached to the console switch, including servers and other switches.
Names	Identifies servers by unique names.

Accessing the Setup Menu

To access the **Setup** menu:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup**. The **Setup** dialog box is displayed.



Figure 6-2: Setup dialog box

Assigning Server Names

Use the **Names** dialog box to identify individual servers by name rather than by port number. The Names list is always sorted by port order, and the names are stored in the Interface Adapter. If you move the Interface Adapter or server to another switch port, the IP Console Switch recognizes the names and configurations.

NOTE: If a server is powered off, its respective Interface Adapter is not displayed in the Names list.

Accessing the Names Dialog Box

To access the **Names** dialog box:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup, Names**. The **Names** dialog box is displayed.

NOTE: If the server list has changed since it was last displayed, the mouse cursor turns into an hourglass as the list automatically updates. No mouse or keyboard input is accepted until the list update is complete.

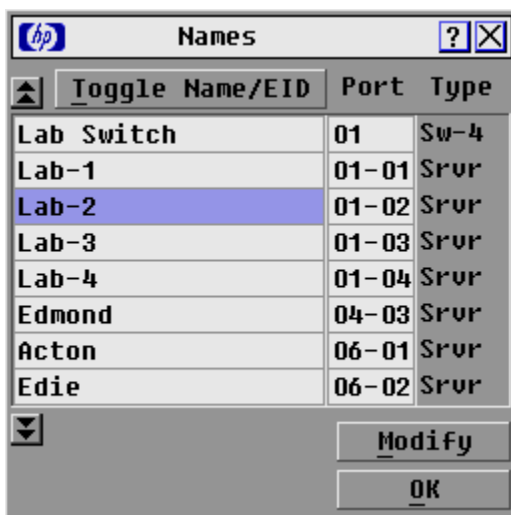


Figure 6-3: Names dialog box

Assigning Names to Servers

To assign names to servers:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup, Names**. The **Names** dialog box is displayed.
3. Select the name or port number, and click **Modify**. The **Name Modify** dialog box is displayed.

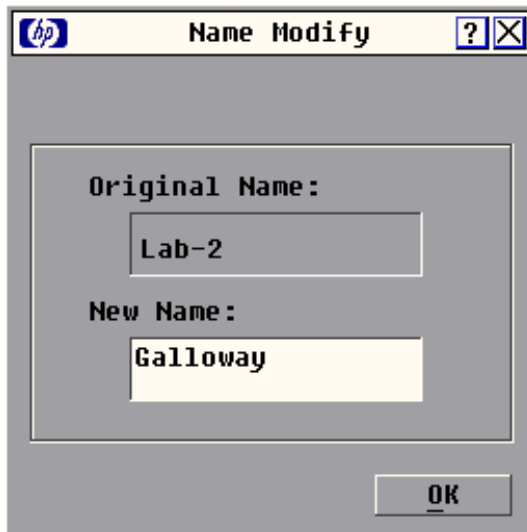


Figure 6-4: Name Modify dialog box

4. Enter a name in the **New Name** field. Names can be 1 to 15 characters in length. Permitted characters are case-sensitive and can consist of A–Z, 0–9, spacebar, and hyphen.
5. Click **OK** to transfer the new name to the **Names** dialog box. Changes made to the **Names** dialog box are not saved until you click **OK**.
6. Repeat steps 3 through 5 for each server in the system.
7. Click **OK** in the **Names** dialog box to save your changes.

-or-

Click **X** to exit, or press the **ESC** key to exit the dialog box without saving changes.

Assigning Device Types

While the console switch automatically discovers cascade switches attached to your unit, you must specify the number of ports on the cascade switch through the **Devices** dialog box.

Accessing Devices Dialog Box

To access the **Devices** dialog box:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup, Devices**. The **Devices** dialog box is displayed.

NOTE: The **Modify** button is only available if a configurable switch is selected.

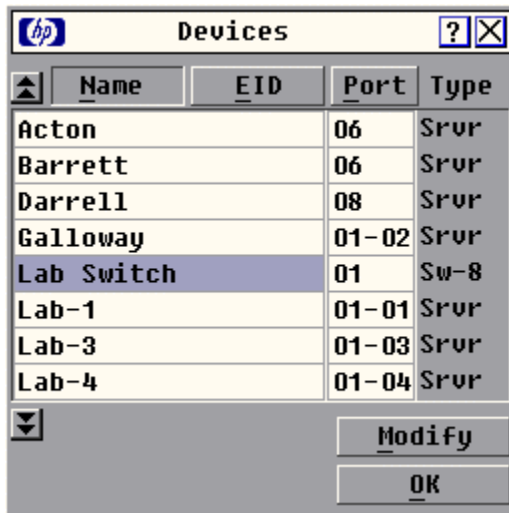


Figure 6-5: Devices dialog box

When the IP Console Switch discovers a cascaded switch, the port numbering changes to accommodate each server under that switch. For example, if the switch is connected to port 2, the switch port is listed as 02, and each server under it is numbered sequentially 02-01, 02-02, and so on.

Assigning Device Types

To assign a device type:

1. In the **Devices** dialog box, select the **Port** number.
2. Click **Modify**. The **Device Modify** dialog box is displayed.
3. Choose the number of ports supported by the cascaded console switch.
4. Click **OK**.
5. Repeat steps 2 through 4 for each port the user wants to assign a device type.
6. Click **OK** in the **Devices** dialog box to save settings.

NOTE: Changes made in the **Device Modify** dialog box are not saved until you click **OK** in the **Devices** dialog box.

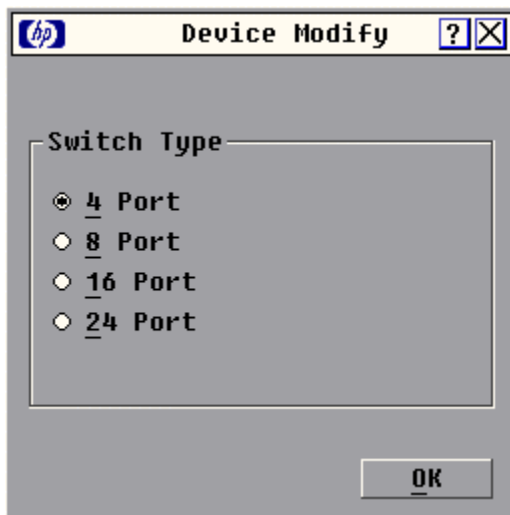


Figure 6-6: Device Modify dialog box

Changing the Display Behavior

From the **Menu** dialog box, the display order of servers, switch connection mode, and a time to delay display of the OSD after pressing the **Print Scrn** key can be changed. The display order setting alters how servers display in several screens, including the **Main**, **Devices**, and **Broadcast** dialog boxes.

Accessing the Menu Dialog Box

To access the **Menu** dialog box:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup**. The **Setup** dialog box is displayed.
3. Click **Menu**. The **Menu** dialog box is displayed.

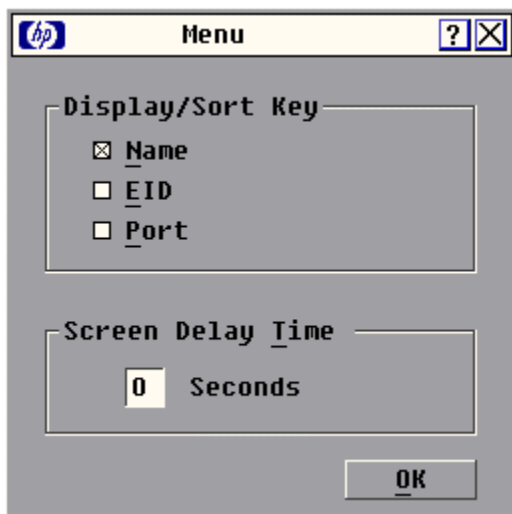


Figure 6-7: Menu dialog box

Selecting the Display Order of Servers

To choose the display order of servers:

1. From the **Menu** dialog box, select **Name** to display servers alphabetically by name.

-or-

Select **EID** to display servers numerically by Interface Adapter ID number.

-or-

Select **Port** to display servers numerically by port number.

2. Click **OK**.

Setting Screen Delay Time

Setting a time to delay the display of the OSD enables you to complete a soft switch without displaying the OSD. To perform a soft switch, see the “Soft Switching” section in this chapter.


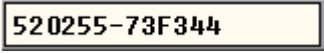


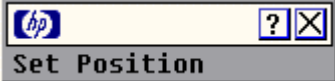
To set the Screen Delay Time for the OSD:

1. From the **Menu** dialog box, enter the number of seconds (0–9) the OSD is delayed after pressing the **Print Scrn** key. Entering **0** instantly displays the OSD with no delay.
2. Click **OK**.

Controlling the Status Flag

The status flag is displayed on the desktop and shows the Name or EID number of the selected server or the status of a particular port. Use the **Flag** dialog box to change the flag display by server Name or EID number or to change the flag color, opacity, display time, and location on the desktop.

Table 6-4: OSD Status Flags

Flag	Description
	Flag type by Name
	Flag type by EID number
	Flag indicating that the user has been disconnected from all systems
	Flag indicating that the broadcast is activated
	Control used to set flag position

Accessing the Flag Dialog Box

To access the **Flag** dialog box:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup**. The **Setup** dialog box is displayed.
3. Click **Flag**. The **Flag** dialog box is displayed.

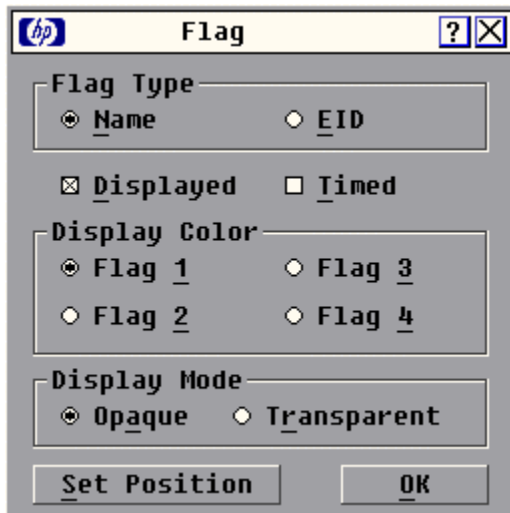


Figure 6-8: Flag dialog box

Displaying the Status Flag

To determine how the status flag is displayed:

1. Select **Name** or **EID** to determine what information is displayed.
2. Select **Displayed** to show the flag constantly or select **Timed** to display the flag for only five seconds after soft switching.
3. Select a flag color in **Display Color**.
4. In the **Display Mode**, select **Opaque** for a solid color flag or select **Transparent** to see the desktop through the flag.
5. Position the status flag on the desktop:
 - a. Click **Set Position** to gain access to the **Position Flag** screen.
 - b. Left-click and hold the title bar and drag to the desired location.
 - c. Right-click to return to the **Flag** dialog box.

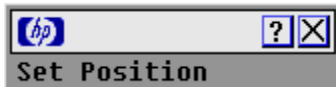


Figure 6-9: Position flag screen

NOTE: Changes made to the position flag are not saved until you click **OK** in the **Flag** dialog box.

6. Click **OK** to save settings.
-or-
Click **X** to exit without saving settings.

Broadcasting to Servers

Analog users can simultaneously control more than one server in a system to be sure that all selected servers receive identical input. For each server receiving the broadcast, you can choose to broadcast keystrokes and/or mouse movements independently.

NOTE: You can broadcast to only one server per Expansion Module connection.

Broadcasting Keystrokes—The keyboard statistics must be identical for all servers receiving a broadcast to interpret keystrokes identically. Specifically, the **Caps Lock** and **Num Lock** modes must be the same on all keyboards. While the switch attempts to send keystrokes to the selected servers simultaneously, some servers can inhibit and thereby delay the transmission.

Broadcasting Mouse Movements—For the mouse to work accurately, all systems must have identical mouse drivers, desktops (such as identically placed icons), and video resolutions. In addition, the mouse must be in exactly the same place on all screens. Because these conditions are extremely difficult to achieve, broadcasting mouse movements to multiple systems can have unpredictable results.

Accessing Broadcast Dialog Box

To access the **Broadcast** dialog box:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup, Broadcast**. The **Broadcast** dialog box is displayed.

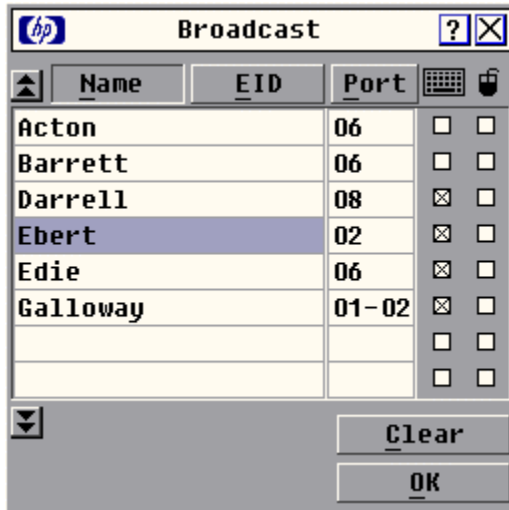


Figure 6-10: Broadcast dialog box

Broadcasting Selected Servers

To broadcast selected servers:

1. From the **Broadcast** dialog box, select the keyboard and mouse checkboxes for the servers that are to receive the broadcast commands.

-or-

Press the **Up** or **Down Arrow** keys to move the cursor to the target server. Then press the **Alt + K** keys to select the keyboard checkbox and/or the **Alt + M** keys to select the mouse checkbox. Repeat for additional servers.

2. Click **OK** to save the settings and return to the **Setup** dialog box. Click **X** or press the **Esc** key to return to the **Main** dialog box.
3. From the **Commands** menu, select the **Broadcast Enable** checkbox to activate broadcasting.
4. From the user station, enter the information and/or perform the mouse movements you want to broadcast.

Activating Broadcasting

To activate or deactivate broadcasting, from the **Commands** menu, select or deselect the **Broadcast Enable** checkbox.

Setting up a Scan Pattern

In Scan mode, the console switch automatically scans port to port (server to server). You can select up to 16 servers from a list of all servers attached to your unit. You can display the list by either server name or EID number by clicking the appropriate button. Selecting the checkbox beside each server to be added to the scan list creates the scan list. The creation of a scan list does not start Scan mode. You must enable Scan mode through the **Scan Enable** checkbox on the **Commands** dialog box.

Accessing the Scan Dialog Box

To access the **Scan** dialog box:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup, Scan**. The **Scan** dialog box is displayed.



Figure 6-11: Scan dialog box

Adding Servers to the Scan List

To add servers to the Scan list:

1. The **Scan** dialog box contains a list of all the servers attached to your unit. Click the checkbox next to the servers you want to scan.

-or-

Double-click a server name or port.

-or-

Press the **Alt** key plus the number of the server you want to scan. You can select up to 16 servers.

2. In the **Scan Time** box, enter the number of seconds (from 3 to 99) before the scan moves to the next server in the sequence.
3. Click **OK**.

NOTE: If the user removes a server from the **Device Modify** dialog box later, the change can affect a custom scan pattern.

Removing Servers from the Scan List

To remove a server from the Scan list:

1. In the **Scan** dialog box, click the server to be removed.

-or-

Double-click a server name or port.

-or-

Click **Clear** to remove all servers from the scan list.

2. Click **OK**.

Starting Scan Mode

To start the Scan mode:

1. Select **Scan Enable** in the **Commands** menu.
2. Click **X** to close the **Commands** dialog box.

NOTE: The scanning begins as soon as you click **Scan**.

Stopping Scan Mode

To stop Scan mode:

If the OSD is open, select a server.

-or-

If the OSD is not open, move the mouse or press any key on the keyboard. Scan mode stops at the currently selected server.

-or-

Deselect **Scan Enable** in the **Commands** menu. Any active connections on the local port are disconnected.

Setting Local Console Switch Security

The OSD enables you to set security on the local port consoles. You can establish a screen saver mode that engages after the console remains unused for a user-definable time delay. When engaged, the console remains locked until any key is pressed or the mouse is moved. You can then enter the password to log in.

Use the **Security** dialog box to lock your console with password protection, set or change the password, and enable the screen saver.

NOTE: If a password has been previously set, you must to enter the password before you can access the **Security** dialog box.

Accessing the Security Dialog Box

To access the **Security** dialog box:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Setup**. The **Setup** dialog box is displayed.
3. Click **Security**. The **Security** dialog box is displayed.

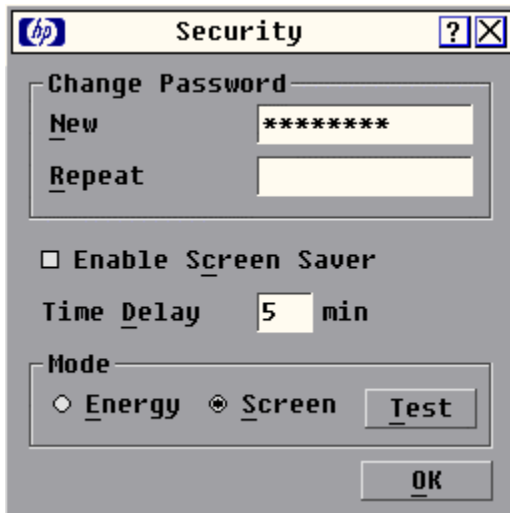


Figure 6-12: Security dialog box

Changing the Password

To set or change the password:

1. From the **Security** dialog box, single-click in the **New** field and press the **Enter** key if the OSD is not open, or double-click the **New** field.
2. Enter the new password in the **New** field, then press the **Enter** key.

IMPORTANT: A valid password must be alphanumeric and be 5 to 15 characters in length. Permitted characters are case-sensitive and can consist of A–Z, 0–9, spacebar, and hyphen.

3. In the **Repeat** field, reenter the password and press the **Enter** key.
4. Click **OK** to change the password.

Setting Password Protection

To password protect your local console:

1. From the **Security** dialog box, set your password as described in the previous procedure.
2. Select **Enable Screen Saver**.
3. Enter the number of minutes for **Time Delay** (from 1 to 99) to delay activation of password protection and the screen saver feature.
4. For **Mode**, select **Energy** if your monitor is Energy Star® compliant. Otherwise, select **Screen**.



CAUTION: Monitor damage can result from the use of energy mode with monitors not compliant with Energy Star.

5. (Optional) Click **Test** to activate the screen saver test, which lasts 10 seconds and returns you to the **Security** dialog box.
6. Click **OK**.

Logging on to Switch

To log on to the IP Console Switch:

1. Press any key on the keyboard, or move the mouse. The **Password** dialog box is displayed. Enter the password, then click **OK**.
2. Press the **Print Scrn** key.

Removing Password Protection

To remove the password protection from the IP Console Switch:

1. From the **Main** dialog box, click **Setup, Security**. The **Password** dialog box is displayed. Enter the password, then click **OK**.
2. In the **Security** dialog box, click the **New** field and press the **Enter** key.
-or-
Double-click the **New** field, leave the **New** field blank, and press the **Enter** key.
3. Click the **Repeat** field and press the **Enter** key.
-or-
Double-click the **Repeat** field, leave the **Repeat** field blank, and press the **Enter** key.
4. Click **OK** if you want to eliminate the password.

Enabling Screen Saver Mode without Password Protection

To enable the screen saver mode without password protection:

1. If your console switch does not require a password to gain access to the **Security** dialog box, proceed to step 2.
-or-
If your console switch is password protected, see the previous procedure, then go to step 2.
2. Select **Enable Screen Saver**.

3. Enter the number of minutes for **Inactivity Time** (1 to 99) to delay activation of the screen saver.
4. Select **Energy** if your monitor is Energy Star compliant. Otherwise, select **Screen**.



CAUTION: Monitor damage can result from the use of energy mode with monitors not compliant with Energy Star.

5. (Optional) Click **Test** to activate the screen saver test, which lasts 10 seconds, then returns you to the **Security** dialog box.
6. Click **OK**.

NOTE: After activation of the screen saver mode disconnects the user from a server, no server is selected. The status flag displays **Free**.

Exiting Screen Saver Mode

To exit the screen saver mode, press any key or move the mouse. The **Main** dialog box is displayed.

Deactivating the Screen Saver

To activating the screen saver:

1. In the **Security** dialog box, clear **Enable Screen Saver**.
2. Click **OK**.

To immediately activate the screen saver, press the **Print Scrn** key, then press the **Pause** key. This command only works when the user is connected to a server.

Managing Server Tasks Using the OSD

You can manage the IP Console Switch system from the **Commands** menu with the OSD, including engaging Scan and Broadcast modes, managing user connections, running diagnostics, and updating your firmware.

Table 6-5: Commands to Manage Routine Task for your Servers

Feature	Purpose
Broadcast Enable	Begin broadcasting to your servers. Configure a server list for broadcasting under the Setup dialog box.
Scan Enable	Begin scanning your servers. Set up a list for scanning in the Setup dialog box.
User Status	View and disconnect users.
Run Diagnostics	Validate the integrity of your system, including memory, firmware cyclic redundant checks (CRC), comm interfaces, switch controller, local and remote video, and Interface Adapters.
Interface Adapter Status	Simultaneously upgrade multiple Interface Adapters.
Reset PS/2	Reestablish operation of PS/2 keyboard and mouse
Display Versions	View version information for the console switch, as well as view and upgrade firmware for individual Interface Adapters.

Accessing the Commands Menu

To access the **Commands** menu:

1. Press the **Print Screen** key. The **Main** dialog box is displayed.
2. Click **Commands**. The **Commands** dialog box is displayed.

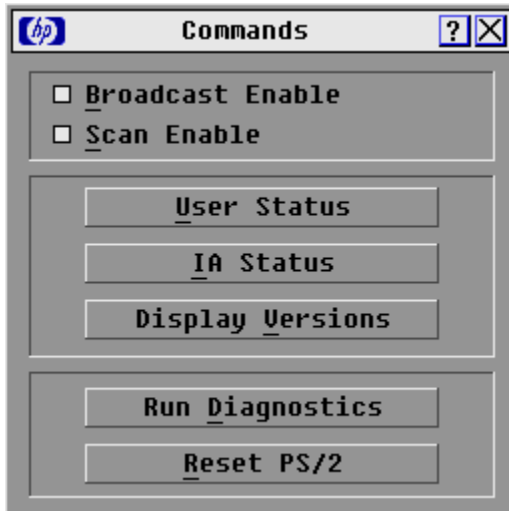


Figure 6-13: Commands dialog box

Viewing and Disconnecting User Connections

You can view and disconnect remote network users through the **User Status** dialog box. The user name (U) is always displayed. However, either the server name or Interface Adapter ID number to which the user is connected can also be displayed. The **User Status** dialog box displays only the number of users the system supports. If there are no users are currently connected to a channel, the fields are blank and the server indicates it is free.

Viewing Current User Connections

To view current user connections:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Commands**. The **Commands** dialog box is displayed.
3. Click **User Status**. The **User Status** dialog box is displayed.

Disconnecting a User

To disconnect a user:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Commands, User Status**. The **User Status** dialog box is displayed.

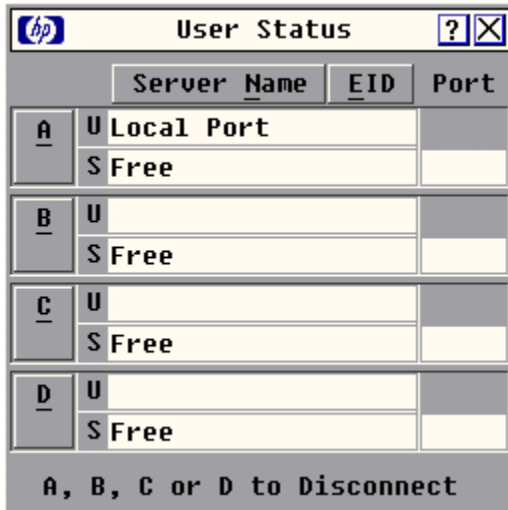


Figure 6-14: User Status dialog box

3. Click the letter of the user to be disconnected. The **Disconnect** dialog box is displayed.



Figure 6-15: Disconnect dialog box

4. Click **OK** to disconnect the user and return to the **User Status** dialog box.

-or-

Click **X** to exit, or press the **Esc** key to exit the dialog box without disconnecting a user.

NOTE: If the **User Status** dialog box has changed since it was last displayed, the mouse cursor becomes an hourglass as the list automatically updates. No mouse or keyboard input is accepted until the list update is complete.

Running System Diagnostics

You can validate the integrity of your system with the Run Diagnostics command. This command checks the main board functions subsystems (memory, intra-board communications, console switch control, and the video channels) for each system controller. When you select **Run Diagnostics**, you receive a warning indicating that all users (remote and local) will be disconnected. Click **OK** to confirm and begin the test.

Running Diagnostics Test

To run diagnostics tests:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Commands**. The **Commands** dialog box is displayed.

3. Click **Run Diagnostics**. A warning message is displayed, indicating that all users will be disconnected.

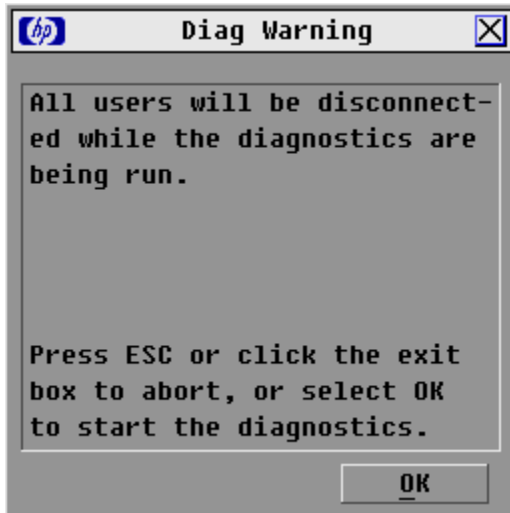


Figure 6-16: Diagnostics Warning

4. Click **OK** to begin.

–or–

Click **X**, or press the **Esc** key to exit the dialog box without running a diagnostic test.

5. All users are disconnected, and the **Diagnostics** dialog box is displayed.

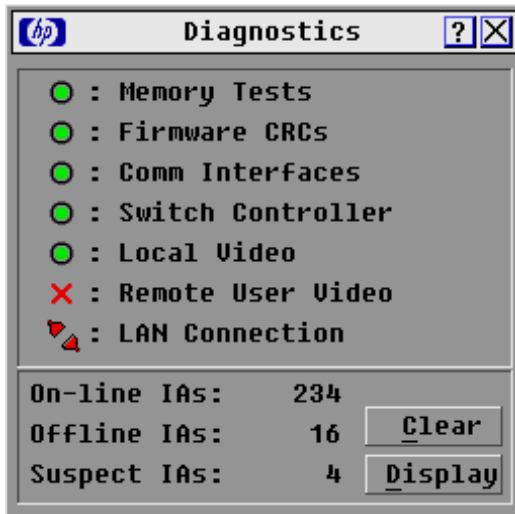


Figure 6-17: Diagnostics dialog box

Test	Description
Memory Test	Reports the condition of the main board RAM. This indicator displays the results of the memory tests performed at system reboot.
Firmware CRC	Validates the current firmware images stored in the system's FLASH by comparing a CRC value on each image and comparing those results to the expected values.
Comm Interfaces	Verifies the intra-board communication subsystems are accessible and functional by querying the communications controller and performing basic register level tests.

continued

Figure 6-17: Diagnostics dialog box *continued*

Test	Description
Switch Controller	Verifies the switch matrix controller is accessible and functional by querying the switch matrix controller and performing basic register level tests.
Local and Remote User Video	Verifies that all the video channel subsystems are accessible, functional, and performing basic register level tests.
LAN Connection	<p>Verifies the LAN connection is accessible and functional by verifying the link controller is responsive and monitoring the network traffic.</p> <ul style="list-style-type: none"> • If the link controller is responsive, the test-passed indicator is displayed. • If the link controller is non-responsive, the test-failed indicator is displayed. • If the link controller is functional but no network traffic has been received, an indicator is displayed.
Online IAs	Indicates the total number of currently connected and powered Interface Adapters.
Offline IAs	Indicates the number of Interface Adapters that have been connected successfully in the past and are apparently powered down.
Suspect IAs	Indicates the number of Interface Adapters that have been detected but are either unavailable for connection or have dropped packets during the ping tests.

- As each test is finished, a pass or fail symbol is displayed.

A passed test is indicated with a green circle, a failed test is indicated by a red X, and the LAN connection has a third indicator, which indicates that the LAN connection is functional but no network traffic has been received. The test is complete when the last test's symbol displays.

- (Optional) If you have any offline Interface Adapters, you can click the **Clear** button to remove them from the list.
- (Optional) If you have any suspect Interface Adapters, you can click the **Display** button. The **Suspect Interface Adapter** dialog box is displayed.

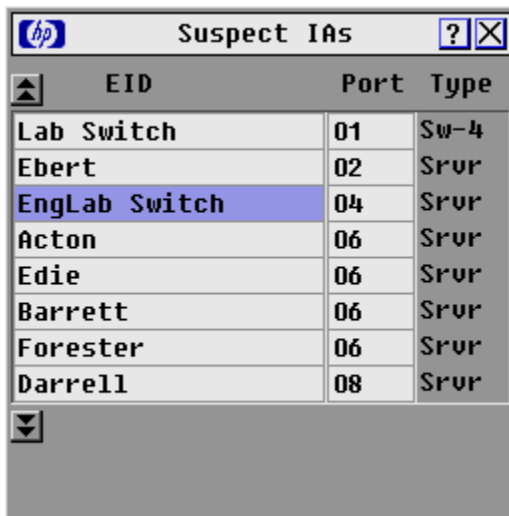


Figure 6-18: Suspect IAs dialog box

Resetting the PS/2 Mouse

If your PS/2 mouse locks up, you can re-establish operation of these peripherals by issuing a reset command. The reset command sends a key sequence to the server, which causes the mouse settings to be sent to the console switch. With communication reestablished between the server and the console switch, functionality is restored to the user.

NOTE: This function is for Microsoft Windows-based computers only. Resetting the PS/2 on a computer running any other operating system might require that you reboot that computer.

To reset the PS/2 mouse values:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Commands**. The **Commands** dialog box is displayed.
3. Click **Reset PS/2**. A warning is displayed.

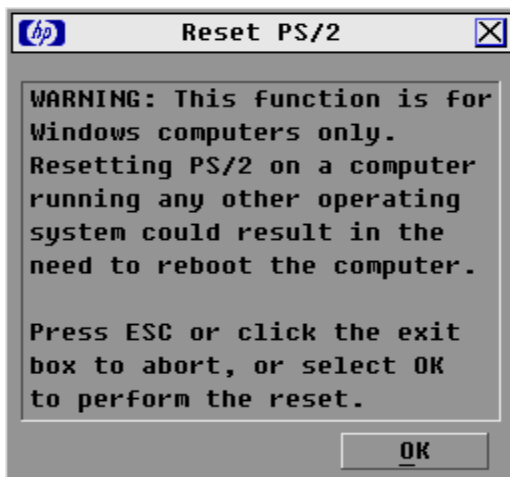


Figure 6-19: Reset PS/2 warning

4. Click **OK**. A message disappears, indicating that the mouse has been reset.
5. Click **X** or press the **Esc** key to exit without sending a reset command to the PS/2 mouse.

Displaying Version Information

The **Version** dialog box enables you to view IP Console Viewer versions, as well as keyboard and mouse information for the currently selected server. For optimum performance, keep your firmware current.

NOTE: Provide the application version number, Figure 6-20, when communicating with HP customer service centers.

To display version information:

1. Click **Version** in the **Commands** dialog box. The **Version** dialog box is displayed. The top half of the box lists the subsystem versions in the IP Console Switch.

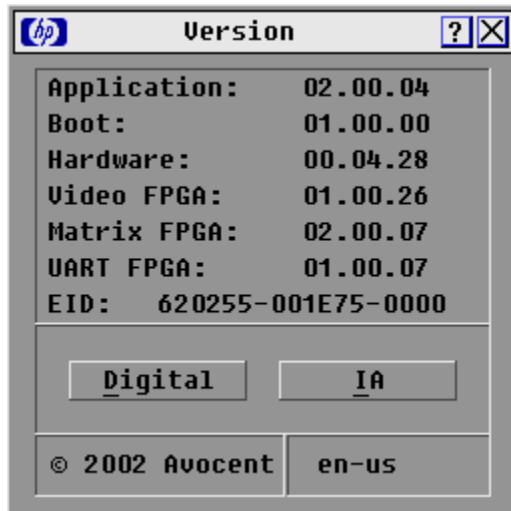


Figure 6-20: Version dialog box

2. Click **Digital** to view the IP Console Viewer versions. The **Digital Version** dialog box is displayed. The top section identifies the digitizer subsystem versions. The center section identifies the current network settings.

NOTE: Provide the application version number, Figure 6-20, when communicating with HP customer service centers.

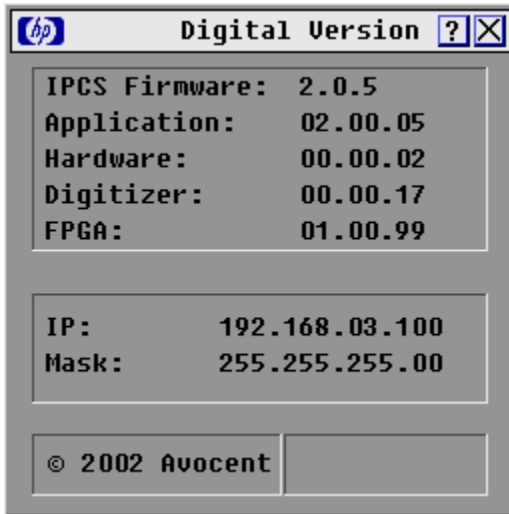


Figure 6-21: Digital Version dialog box

-or-

Click **IA** to access the **IA Selection** dialog box to view individual Interface Adapter cable version information. The **IA Selection** dialog box is displayed.

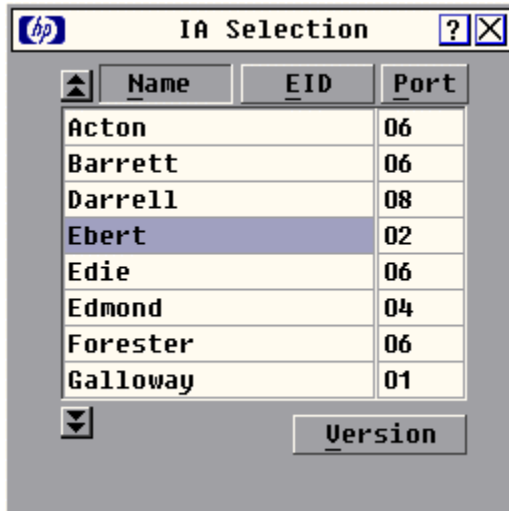


Figure 6-22: IA Selection dialog box

3. To view the selected Interface Adapter cable, click **Version**. The **IA Version** dialog box is displayed.

NOTE: Provide the application version number, Figure 6-19, when communicating with HP customer service centers.

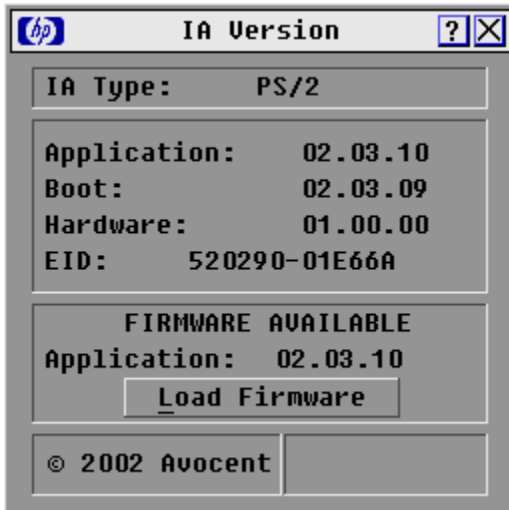


Figure 6-23: IA Version dialog box

4. Click **X** to exit.

Upgrading Firmware using TFTP

The HP IP Console Switch FLASH upgrade feature enables you to update the IP Console Switch with the latest available firmware.

To update the IP Console Switch, you need a Trivial File Transfer Protocol (TFTP) server on the terminal or PC that performs upgrades. After the TFTP has been enabled, upgrade the FLASH firmware, then upgrade the IP Console Switch firmware.

Enabling TFTP for Windows NT

To enable TFTP for Windows NT:

1. Unzip NT_TFTP3.3.ZIP into an empty directory.
2. From the **Start** menu, select **Settings, Control Panel**.
3. Double-click **Network**.
4. Click **Services** and then click **Add**.
5. Click **Have Disk**.
6. In the **Insert Disk** box, enter the path where the extracted files are.
7. On the **Select OEM Option** page, click **OK**.
8. When the product name is displayed in the **Services** list, click **Close**.
9. Click **Yes** to restart.

Enabling TFTP for Windows 2000 and Windows XP

To enable TFTP for Windows 2000 and Windows XP:

1. Unzip W2K_TFTP3.3.ZIP into an empty directory.
2. From the **Start** menu, select **Settings, Control Panel**.
3. Double-click **Add/Remove Programs**.
4. Click **Add New Programs, CD or Floppy**. Follow the on-screen instructions in the **Install Program From Floppy Disk** or **CD-ROM Wizard**.
5. In the **Open** box on the **Run Installation Program** page, enter the path to the location of the extracted files.
6. From the **EqmTFTPS Setup** page, click **Install**.
7. Click **Finish**.
8. From the **Add/Remove Program** page, click **Close**.

Enabling TFTP for Linux

For most systems using RPM packages, TFTP is provided by the TFTP server RPM (RPM-IVH/Redhat/RPMS/). Depending on the type of distribution, the Internet services daemon is provided by xinetd.

NOTE: By default, TFTP executes in secure mode and only provides readable files under the /tftpboot directory. Other directories can be specified through the /etc/xinetd.d/tftp files. In secure mode, TFTP expects the file to be relative to the /tftpboot directory.

To enable TFTP for Linux operating systems:

1. In the GNOME viewer go to the main menu and select **Programs, System, Service Configuration**.
2. In the **Service Configuration** menu, verify that the **xinetd** checkbox is selected to start at boot.

-or-

If the checkbox is not selected, select the box and click **Save**.

3. Find TFTP in the list of services and highlight it.
4. Select the checkbox to start TFTP at boot, then click **Save**.

Verifying TFTP for Linux

To verify that TFTP/TFTPD was properly enabled for Linux operating systems:

1. Enter the TFTP localhost (or name of local system).
2. Download the file by entering the following command:
`etc/tftpboot/filename`
3. Enter `Quit`.

If the TFTP was configured correctly, the preceding steps should transfer the file to the current directory.

Configuring TFTP for Windows

To configure TFTP for Windows operating systems:

1. Access the **Secure TFTP Service** page.

Windows NT 4.0

- a. From the **Start** menu, select **Settings, Control Panel**.
- b. Double-click **Network**.
- c. Click **Services**.
- d. From the **Network Services** list, select **Secure TFTP Service** and click **Properties**. The **Secure TFTP Service** window is displayed.

Windows 2000 or Windows XP

- a. From the **Start** menu, select **Run**.
- b. At the prompt, enter `eqmtftpc` in the **Open:** field, then click **OK**. The **Secure TFTP Service** window is displayed.

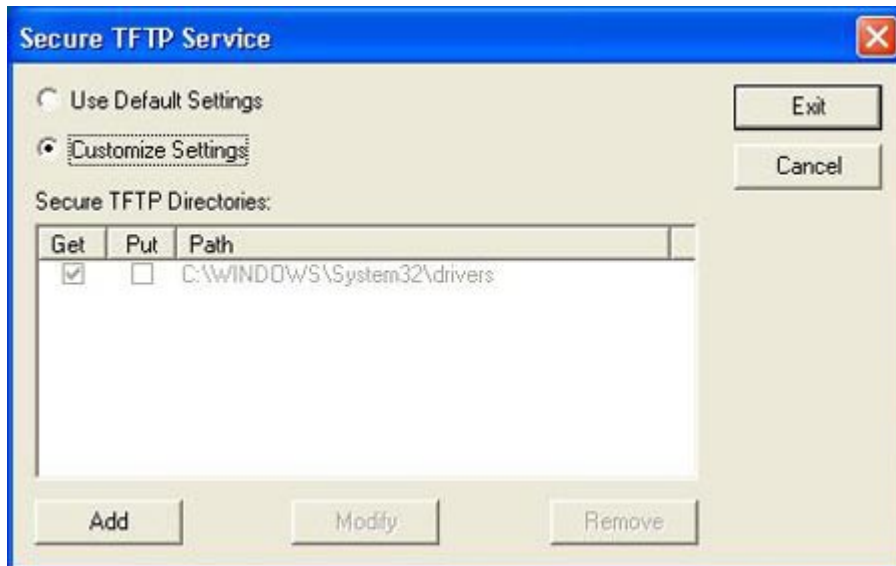


Figure 7-1: Secure TFTP Service window

2. You can use the default settings for the directory with the GET access or PUT access rights set as indicated in the following procedure. To use the default settings, select **Use Default Settings**, then click **Exit**.

To customize settings, select **Customize Settings**.

- a. To add directories, click **Add**. The **Secure TFTP Directory** dialog box is displayed.
- b. Enter the path name of the directory, or click **Browse**, select a directory, and then click **OK**.
- c. To enable GET access or PUT access to that directory, select the **GET Access** or the **PUT Access** checkbox.
- d. Click **OK**. The added directory is displayed in the list.



Figure 7-2: Secure TFTP Directory dialog box

3. To change an existing entry in the directory list, select the directory name in the **Path** column.
 - a. To delete the entry, click **Remove**, then click **Exit**.
 - b. To modify an entry's access rights, select the appropriate checkbox in the **GET** or **PUT** columns.
 - c. To modify an entry's pathname, click **Modify**, then enter the pathname of the desired directory, or click **Browse** to select a directory.
 - d. Click **Exit**, then click **Close**.

Updating the IP Console Switch

Before beginning the update procedure, be sure that the Secure TFTP Server is installed and that the GET access permissions for the folder the updated file is in is selected. Also, be sure that the IP Console Switch is on the same network as the computer that is being used for the update.

Updating the IP Console Switch Hardware

To update the IP Console Switch hardware:

1. Connect one end of a serial cable to an available COM port on the server that is to be viewed locally from the IP Console Switch.
2. Connect the other end of the above serial cable to the serial port on the IP Console Switch.
3. Plug the supplied power cord in to the rear of the IP Console Switch and then in to a valid power source.
4. Power on the IP Console Switch. The activity indicator on the rear panel powers on. The activity indicator blinks for 30 seconds while performing a self-test. Approximately 10 seconds after it stops blinking, press the **Enter** key to access the main menu.

5. Configure the terminal emulation software for the server, such as HyperTerminal for Windows operating systems or Minicom for Linux operating systems.

To configure HyperTerminal:

- a. From the desktop screen, click **Start, Programs, Accessories, Communications, HyperTerminal**. The **Connection Description** window is displayed.
- b. Enter a name for the description, and click **OK**. The **Connect To** window is displayed.
- c. Select the **Communication Port** that is connected to the KVM switch through a serial cable, then click **OK**. The **COM1 Properties** window is displayed.
- d. Select **9600** for the Bits Per Second, **8** for Data Bits, **None** for Parity, **1** for Stop Bits, and **None** for Flow Control, then click **OK**. The HyperTerminal auto-connects to the console switch.
- e. Press the **Enter** key to access the console switch option menu.

To configure Minicom:

IMPORTANT: Minicom is a utility that is loaded during the installation of Red Hat 7.2 and 7.3. However, if you do not select the option to install the Linux Utilities during the operating system installation, you are not able to use Minicom without downloading the Minicom 1.831-16.i386.rpm file from the Red Hat website. (Refer to the procedure for installing RPMs on the Red Hat website).

- a. Log on to a Linux console, or open a terminal and enter `minicom-s` at the command prompt. The **Configuration** menu is displayed.
- b. Select **Serial Port Setup**. The **Change which setting?** menu is displayed.
- c. Select **Option A (Serial Device)**. Manually change the device type from “dev/modem” to “/dev/ttyS0” and press the **Enter** key.
- d. Select **Option E (Bps/Par/Bits)**. The **Comm Parameters** menu is displayed.
- e. Select **E (Speed 9600 Bps)**, and press the **Enter** key. The designation 9600 8N1 is displayed next to Option E.
- f. Select **Option F (Hardware Flow Control)**.

Be sure that the **Change which setting?** menu is configured as follows:

A—Serial Device: /dev/ttyS0

B—Lockfile Location: /var/lock

C—Callin Program:

D—Callout Program:

E—Bps/Par/Bits: 9600 8N1

F—Hardware Flow Control: No

G—Software Flow Control: No

- g. Press the **Enter** key to return to the **Configuration** menu. Scroll down to the **Save setup as dfl** option, and press the **Enter** key.
- h. Scroll down the **Configuration** menu to the **Exit from Minicom** option, and press the **Enter** key.

- i. From the Linux Red Hat 7.2 and 7.3 command prompt, enter `Minicom`. As soon as a connection is established, the **Main** menu for the IP Console Switch is displayed. Follow the on-screen options to configure the IP Console Switch. The **IPViewer HyperTerminal** menu with six options is displayed.

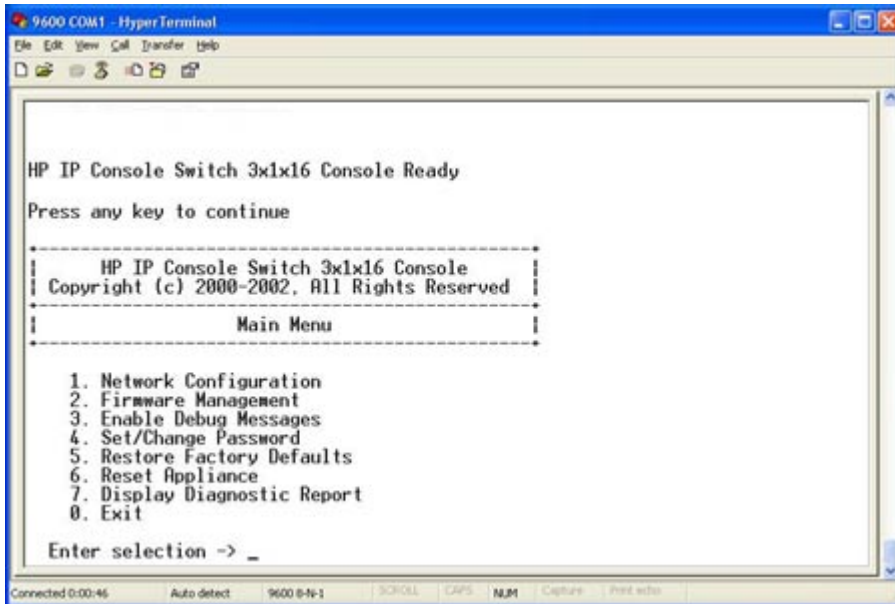


Figure 7-3: IPViewer HyperTerminal menu

6. Select **Option 2—Firmware Management**. The **Firmware Management** menu is displayed.

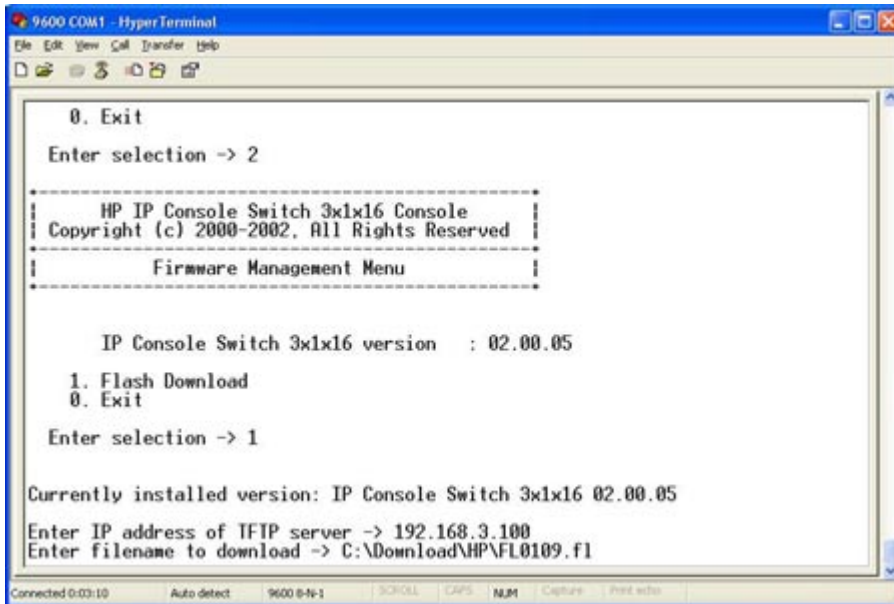


Figure 7-4: Firmware Management menu

7. Select **Option 1—Flash Download**.
8. Enter the IP address of the TFTP server that has the updated file and the exact path of the updated file (for example, C:\Download\HP\FL0109.fl).
9. Enter **Y** at the prompt to download the upgrade file from the given IP address. The IP Console Switch begins upgrading.



CAUTION: Do not cycle power to the IP Console Switch during this process. A loss of power might render the IP Console Switch inoperable and require that the unit be returned to the factory for repair. Be patient; the update can take as long as 10 minutes.

10. When the upgrading process is complete, The IP Console Switch reboots. The **IP Console Switch is ready.** is displayed.

Updating the IP Console Switch through the IP Console Viewer

1. Select the **IP Console Switch**, and click the **Manage Console Switch** icon. The **IP Console Viewer** window is displayed.

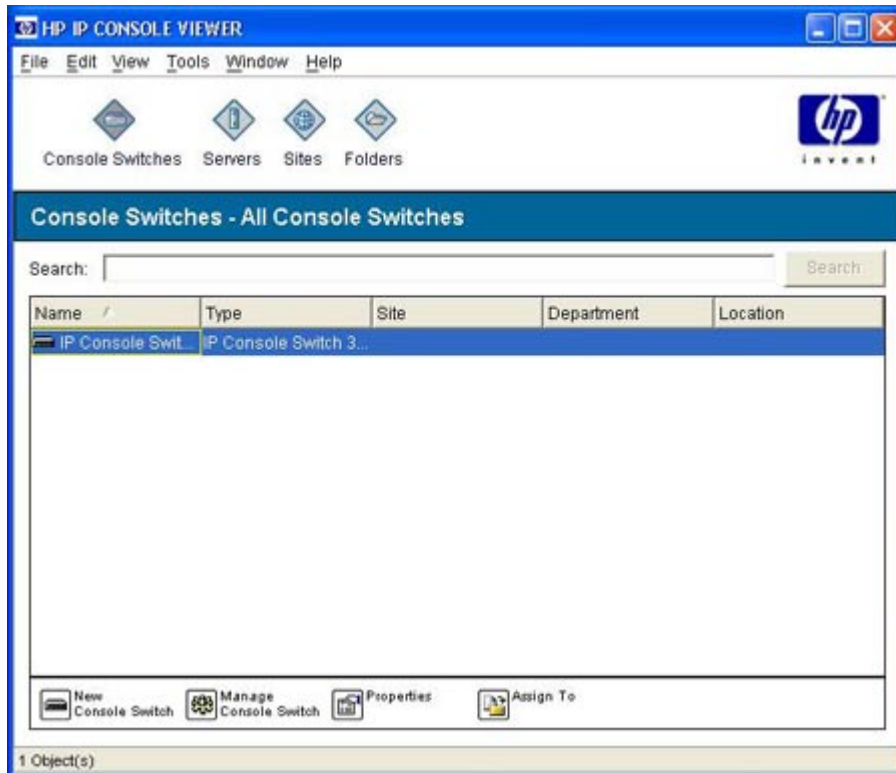


Figure 7-5: IP Console Viewer window

2. Select the **Tools** tab, and click the **Upgrade Console Switch Firmware** icon.

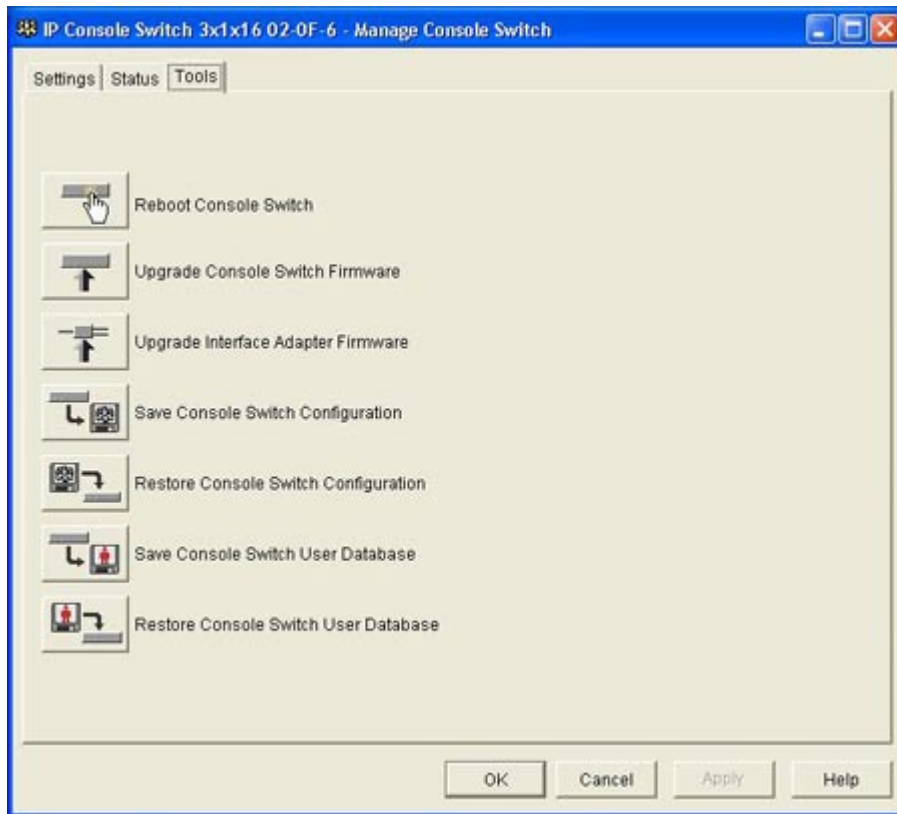


Figure 7-6: Tools tab

3. (Optional) Enter in the IP address of the computer the update is located on in the **TFTP Server IP Address:** field.
4. (Optional) Enter in the complete path of the update file in the **Firmware Filename:** field (for example, C:\Download\HP\FL0109.fl).

NOTE: For Linux operating systems a path name is not required; however, the firmware images should be saved in the TFTPBoot folder.



Figure 7-7: Upgrade Console Switch Firmware dialog box

5. Click **Upgrade**.



CAUTION: Do not cycle power to the IP Console Switch during this process. A loss of power might render the IP Console Switch inoperable and require that the unit be returned to the factory for repair. Be patient; the update can take as long as 10 minutes.



Figure 7-8: Upgrade Console Switch Firmware warning

6. After the upgrade completes, click **Close** to reboot the IP Console Switch.
7. After rebooting, the message Firmware Upgrade has completed. The Console Switch is ready. is displayed.

Establishing LAN Connections

To connect an IP Console Switch to a network:

NOTE: Although 10Base-T Ethernet can be used, HP recommends a dedicated, switched 100Base-T network for improved performance.

Connect the network cable from the LAN port on the rear panel of the IP Console Switch to the network, then power on all attached systems. The current IP Console Switch system open network ports are 2068, 8192, 3211, and 161.

Upgrading FLASH Firmware

IMPORTANT: The latest FLASH firmware can be found on the HP website at <http://h18004.www1.hp.com/products/servers/proliantstorage/rack-options/kvm/index-console.html>.

To upgrade FLASH firmware to the IP Console Switch:

1. Connect a terminal or a PC running terminal emulation software (such as HyperTerminal) to the configuration (serial) port on the back of the IP Console Switch. The terminal should be set to 9600 baud, 8 bits, 1 stop bit, no parity, and no flow control.
2. Connect the LAN port on the IP Console Switch either directly, using a network cross-over cable, or by means of an Ethernet hub and standard CAT5 cable, to the terminal or PC that is being used as the TFTP server.
3. Start the server software and the terminal emulation software.
4. If the IP Console Switch is not powered on, power it on now. After approximately 40 seconds, the IP Console Switch displays an `HP IP Console Ready . . .` message.
5. Press any key to continue or to access the **IPViewer HyperTerminal** dialog box. The **IPViewer HyperTerminal** dialog box is displayed.

6. Get the IP address of the TFTP server by extracting it from the operating system tools (might be operating system-dependent):
 - a. Right-click **Network Neighborhood**.
 - b. Select **Properties**.
 - c. Select the **Protocols** tab.
 - d. Select **TCP/IP protocol**.
 - e. Select **Properties**.
 - f. Note the IP address.
7. Assign the IP address in the IP Console Switch, if needed:
 - a. In the **IPViewer HyperTerminal** dialog box, enter 1 to select **Network Configuration**.
 - b. Note the IP Console Switches IP address. The first three numbers must be the same as in the servers IP address from step 6. The last number must be different. If the IP Console Switches IP address is not correct, change it as follows: Enter 3 to select **IP address**, and then enter the correct IP address, and press the **Enter** key.
 - c. Enter 0 to exit the **Network Configuration** menu. If the user changed the IP address, wait for the directions in the window.
 - d. Change the IP Console Switch IP address in the TFTP server software to match, if there was a change.
8. From the **IPViewer HyperTerminal** dialog box, enter 2 to select **Firmware Management** menu. The current version the firmware is displayed in the **Firmware Management** menu.
9. From the **Firmware Management menu**, enter 1 to select **FLASH Download**.
10. Enter the IP address of the TFTP server.
11. Enter the path and name of the FLASH file, for example HP IP Console Firmware version X.X.X, and press the **Enter** key.

NOTE: For Linux operating systems a path name is not required; however, the firmware images should be saved in the TFTPBoot folder.

12. Confirm the TFTP download by entering `y` or `yes` and pressing the **Enter** key.
13. The IP Console Switch verifies the download. Enter `y` or `yes` to confirm the upgrade, then press the **Enter** key.
14. The IP Console Switch begins the FLASH upgrade process. On-screen indicators display the upgrade process. When the upload is complete, the IP Console Switch resets and upgrades the internal subsystems. This process takes a few minutes. When the upgrade is complete, the startup message from step 4 is displayed in the **IP Viewer HyperTerminal** dialog box.



CAUTION: Do not cycle power to the IP Console Switch during this process. A loss of power might render the IP Console Switch inoperable and require that the unit be returned to the factory for repair. Be patient; the update can take as long as 10 minutes.

15. Click **X** to exit the **IPViewer Hyper Terminal** window.

Analyzing FLASH Failures

At times a FLASH update fails. Unlike the IP Console Switch, which returns a failure message when it encounters any problems, a FLASH update failure gives no direct indications that a failure occurred.

When a failure occurs, you must verify several aspects of the update:

- Be sure that TFTP is configured properly. TFTP is an unreliable transport mechanism. A busy network can result in lost packets, which would cause the update to fail.
- Be sure that the `tftpd` log file `/var/log/secure` is secure. The log indicates if a successful `tftpd` connection was made and if any abnormal operations occurred.
- Be sure that the proper pathname to the image file is used.

Upgrading Interface Adapter Firmware



CAUTION: If a local port user has access to a specific Interface Adapter, a remote user can obstruct the local port user's access by performing an Interface Adapter firmware upgrade.

To upgrade Interface Adapter firmware simultaneously:

1. Press the **Print Scrn** key. The **Main** dialog box is displayed.
2. Click **Commands**. The **Commands** dialog box is displayed.
3. Click **IA Status**. The **IA Status** dialog box is displayed.

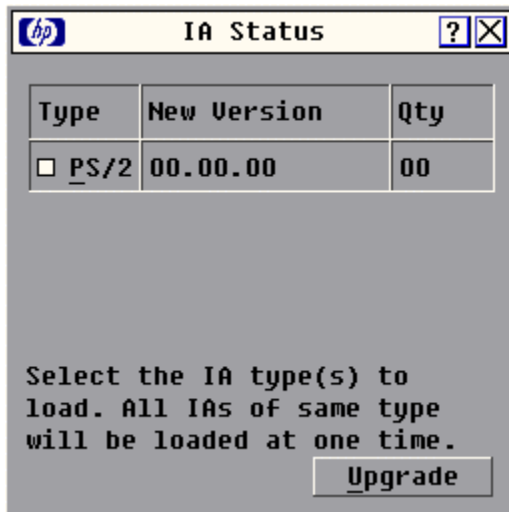


Figure 7-9: IA Status dialog box

4. Select the **PS/2** checkbox, then click **Upgrade**. The **IA Upgrade** dialog box is displayed.

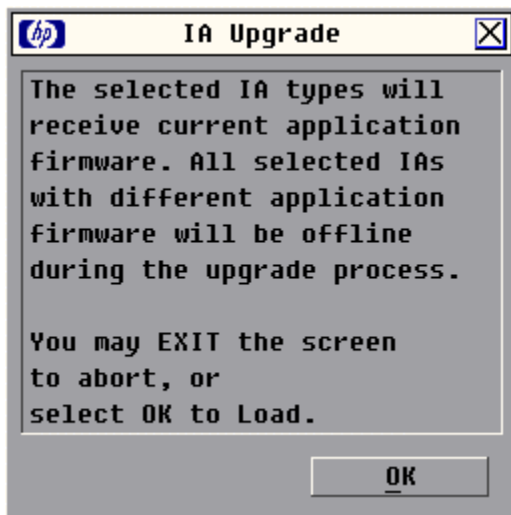





Figure 7-10: IA Upgrade dialog box

5. Click **OK**.
6. Press the **Esc** key to return to the **Main** dialog box. The OSD IP Console Switch indicators are displayed as  (yellow) while the upgrade is in progress. The OSD IP Console Switch indicators changes to  and then to  (green) when the upgrade is complete.

NOTE: Wait until the OSD IP Console Switch indicators are displayed as  (green) before continuing.

To upgrade Interface Adapter firmware individually:

1. Click **Version** in the **Commands** dialog box. The **Version** dialog box is displayed.

NOTE: Provide the application version number, Figure 7-11, when communicating with HP customer service centers.

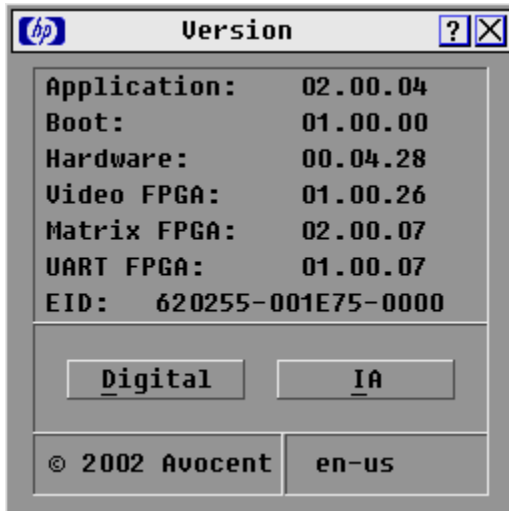


Figure 7-11: Version dialog box

2. Click **IA**. The **IA Selection** dialog box is displayed.

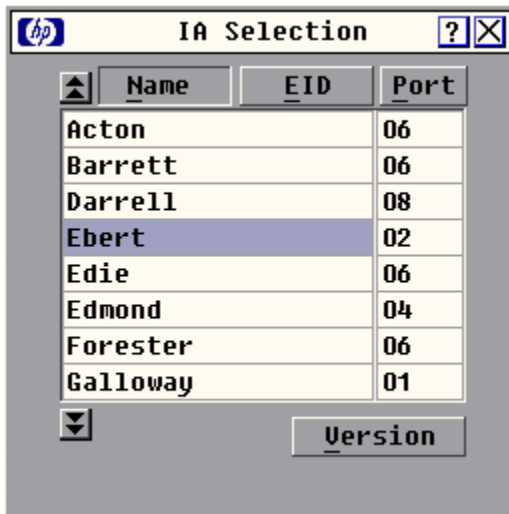


Figure 7-12: IA Selection dialog box

3. Select the individual Interface Adapter, and click **Version**. The **IA Version** dialog box is displayed.

NOTE: Provide the application version number, Figure 7-11, when communicating with HP customer service centers.

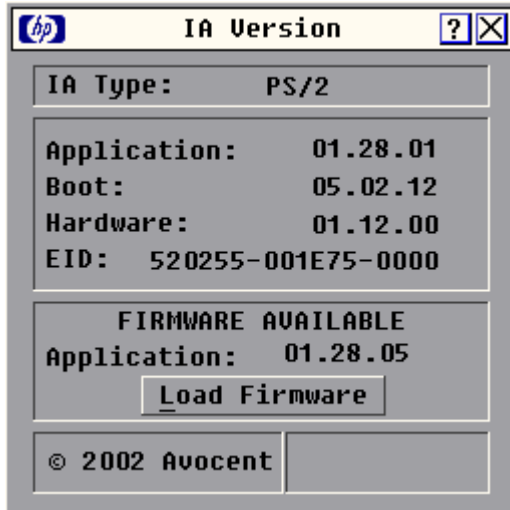


Figure 7-13: IA Version dialog box

4. Click **Load Firmware**.

Troubleshooting

Table 8-1: Troubleshooting

Problem	Solution
The local user cannot view the IP Console Switch on-screen copyright notice.	<ul style="list-style-type: none"> • Be sure that the power source is valid. • Be sure that the cables are connected properly. • Be sure that the monitor is valid.
IP Console Switch on-screen copyright notice is distorted.	<ul style="list-style-type: none"> • Be sure that the power source is valid. • Be sure that the cables are connected properly. • Be sure that the monitor is valid.
Local user cannot view OSD flag.	Check the preferences selected in the OSD to determine if the local port display has been disabled or set to time out. If the preferences are set to not display the flag, or to have the flag time out, then the OSD flag does not display.
Local user cannot activate and/or view the OSD, and the flag disappears.	<ul style="list-style-type: none"> • Be sure that the local port keyboard is connected properly. • Be sure that the keyboard is valid.
The OSD is distorted or not readable on the local port video display.	Be sure that the monitor supports the refresh rate to which target server is set.

continued

Table 8-1: Troubleshooting *continued*

Problem	Solution
The green activity indicator does not display when the console switch is powered on.	<ul style="list-style-type: none"> • Be sure that the console switch is powered on and that the power source is valid. • Be sure that the cables are connected properly.
While viewing a cascaded Compaq legacy console switch and an IP Console Switch on separate monitors, the user presses mouse/keyboard reset button and the OSD goes blank with a “Mouse and keyboard have been reset” message.	The mouse and keyboard are locked up on the Compaq legacy console switch. After approximately one minute, the Compaq legacy console switch will return to normal functionality.
The mouse does not align.	Refer to the <i>HP IP Software Guide</i> included in the Rack Products Documentation CD included with this product.
IP Console Switch system does not recognize Compaq legacy console switches.	All Compaq legacy console switches must be upgraded with SoftPaq firmware version 2.1.0 or later.
An Expansion Module is not being recognized by a Compaq legacy console switch.	An Expansion Module is considered a level of cascading and therefore cannot be used in combination with a cascaded Compaq legacy console switch.
The OSD is inaccessible.	Press the Ctrl key twice.
The mouse and keyboard lose functionality after the Reset PS/2 button is pressed while operating a Unix-based platform.	The Reset PS/2 button is a Windows-based function. Restart the desktop to gain mouse and keyboard functionality.
I cannot access the IP Console Switch after losing my password.	Call the HP Customer Support Center for more detailed instructions.
RILOE and ILOE are not working correctly with the IP Console Switch system.	The HP IP Console Switch firmware must be version 2.0.6 or later.

Regulatory Compliance Notices

Regulatory Compliance Series Number

For the purpose of regulatory compliance certifications and identification, your product has been assigned a unique series number. The series number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this series number. The series number is not the marketing name or model number of the product.

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (for example, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The FCC rating label on the device shows the classification (A or B) of the equipment. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. After the Class of the device is determined, refer to the corresponding statement in the following sections.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit that is different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Declaration of Conformity for Products Marked with the FCC Logo, United States Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact us by mail or telephone:

- Hewlett-Packard Company
P.O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000
- 1-800-652-6672 (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact us by mail or telephone:

- Hewlett-Packard Company
P.O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000
- 1-281-514-3333

To identify this product, refer to the part, series, or model number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Mouse Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (the equivalent international standards are in parentheses):

- EN55022 (CISPR 22) – Electromagnetic Interference
- EN55024 (IEC61000-4-2, 3, 4, 5, 6, 8, 11) – Electromagnetic Immunity
- EN61000-3-2 (IEC61000-3-2) – Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3) – Power Line Flicker
- EN60950 (IEC950) – Product Safety

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

BSMI Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Electrostatic Discharge

Preventing Electrostatic Damage

A discharge of static electricity from a finger or other conductor can damage system boards or other static-sensitive devices. This type of damage can reduce the life expectancy of the device.

To prevent electrostatic damage when setting up the system or handling parts:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods To Prevent Electrostatic Damage

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm \pm 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have a HP authorized reseller install the part.

For more information on static electricity or assistance with product installation, contact your authorized reseller.

Power Cord Set Requirements

The power cord set meets the requirements for use in the country where you purchased your equipment. The voltage selection switch enables you to select the appropriate line voltage for your server.

Power cord sets for use in other countries must meet the requirements of the country where you use the server. For more information on power cord set requirements, contact your HP authorized dealer.

General Requirements

The following requirements are applicable to all countries:

- The length of the power cord must be at least 1.8 m (6.0 ft) and a maximum of 3.7 m (12 ft).
- The power cord set must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.
- The power cord set must have a minimum current capacity and nominal voltage rating of 10 A/125 volts AC or 10 A/250 volts AC, as required by the power system of each country.
- The appliance coupler must meet the mechanical configuration of an EN60320/IEC 320 Standard Sheet C13 Connector for mating with the appliance outlet on the computer.

Country-Specific Requirements

Use Table C-1 to identify the appropriate accredited agency in your country.

Table C-1: Power Cord Set Requirements By Country

Country	Accredited Agency	Applicable Note Numbers
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

1. Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. Flexible cord must be Type SVT or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V).
3. Appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 1.0 mm² conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

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